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METAPHYSICS OF ENERGY.

BY

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PUBLISHED BY THE INDIAN INSTITUTE OF
PHILOSOPHY, AMALNER
(E. KHANDESH.)

Printed by R. H. Advani, B. A. at the Standard Printing Works,
Hyderabad Sind
and
Published by Ghanshamdas Rattanmal Malkani, M. A.
for The Indian Institute of Philosophy,
Amalner (E. Khandesh.)

PREFACE.

THE problem of energy has generally been left to the scientist. It is taken for granted that energy is a fact of our experience, and that philosophy has little to say about matters of fact that have their certitude established by universal belief of mankind. From the savage to the savant, it is held as an undisputed fact that there is power in nature, power in us, and power in any conceivable form of ulterior reality. Men may differ as to the nature of this power, but nobody questions the fact itself.

The aboriginal reduced nature to a congeries of wills and propitiated them. The later scientists and positivists, in their attempt to free nature from all anthropomorphic ideas, purged it of all forces and wills. But this so-called emancipation of scientific thought, though useful for the immediate purposes of science, left nature a huge and inexplicable illusion, leading most of these thinkers naturally to agnosticism; for, change is a patent fact of experience; how can it be explained without some *power* behind it? And yet the nature of this power defies thought. Humanity, as represented by the history of Western culture and civilization, has thus wavered between blind faith and agnosticism. After centuries of progress, its final attitude has been to relegate this problem to the scientist, who indeed speaks profusely about force and energy, but always finds it convenient to restrict these terms to certain conceptions of his own, formulated to suit *his* limited diagnosis of natural phenomena. Modern and contemporary philosophy has little to say definitely about it. In short, the final result of Western thinking has been to leave the problem where it was, in the mist of oboriginal ignorance, relieved only by a learned agnosticism that is not unoften painfully conscious of its strangely grotesque constructions of nature.

It will perhaps be thought ridiculous in some quarters, for a professed student of Advaitism to attempt the solution of such a concrete problem; for that philosophy is known to deny all facts of experience, and to revel merely in high-sounding but empty words about an Absolute that is to all appearances a meaningless fiction. Can such a philosophy solve one of the most concrete of our problems, when some of the best intellects among men, with a most intimate touch with reality and actual facts, have failed? The doubt is plausible,—at least sincere. But all I can say at present in answer to it is to refer to the following pages and the solution contained therein.

My difficulties have been great; for I am not a student of science, and a criticism of scientific conceptions about force and energy is absolutely essential, at this stage of our culture, to the proper comprehension of the problem and its attempted solution. Much as I would have liked to set forth the problem and its solution in plain and popular form, I have been obliged, by the necessity of catching the ear of Western culture, to enter into discussions and criticisms that may not be readily intelligible to the average reader who has had little or no initiation in matters philosophical. Besides, Western science and philosophy represent perhaps the best formulated and most organized body of possible objections to different Advaitic positions, if we can credit Advaitism with any; and the solution of no problem can hope to carry weight in modern times, unless these objections have been boldly faced and answered. Here I must apologize for the necessarily profuse quotations from Western authors, and any possible inaccuracies that might have crept in, in my representation of the scientific side. But this cannot detract from the value of the answers themselves, which are not aimed so much against actual objections as against possible ones.

In the end, I must acknowledge my debt to the founder of this Institute, Mr. Pratap Seth, whose love for Advaitism combined with logical acuteness has always been a guiding star in my deliberations, and has helped me to face boldly every doubt and difficulty that has come to me and that I have been able to formulate to myself in the language of communication.

AMALNER,
1st January 1920.

G. R. MALKANI.

CONTENTS.

PAGE.

PREFACE ... ...

INTRODUCTION ... ...

CHAPTER I.

Energy in Physical Sciences.

A.

1. The standpoint of Mechanics ... 20
2. Its method contrasted with its ambitions 20
3. Meaning of matter and energy in Mechanics 22
4. Its conclusion 23

B.

5. The standpoint of Physics ... 24
6. The inherent uncertainty about all theories 25
7. Examination of some theories of Physics 26
8. The theory of one substance ... 27
9. The tenability of ascribing specific characteristics to energy ... 28

C.

10. The problems of homogeneous energy alone relevant to science ... 32
11. Energy diffuse and available ... 33
12. Potential energy 33
    (*a*) Energy must be in continuous effort 34
    (*b*) The question considered from the molecular point of view ... 35

PAGE.

(*c*) No ground for potentiality anywhere 36
(*d*) The inherent meaninglessness ... 37
13. The conservation of energy ... 37
(*a*) Conservation and the law of impossibility of perpetual motion... 39
(*b*) Conservation implies homogeneity and independence of energy ... 40
(*c*) Such independence cannot be merely conceptual and abstract 41
(*d*) The theory of conservation though based on that of work is really incompatible with it ... 41
(*e*) The consequent dilemma ... 42
(*f*) Energy, as science conceives it, is a self-contradictory notion ... 42
(*g*) The law of conservation cannot measure all the energy of the universe 43
(*h*) How Prof: Mach would prove conservation 44
14. Dissipation of energy 46
(*a*) The meaning of the law ... 47
(*b*) Conservation of energy is not opposed to its dissipation ... 48
(*c*) The metaphysical issue involved in the law of dissipation ... 48
(*d*) Levels of energy 50
(*e*) Example from heat ... 50

PAGE.
15. A statement of the issues... ... 51

D.

16. Newton's attitude 51
17. The solution of Boscovich ... 52
18. Lord Kelvin's Kinematic theory ... 53
19. Failure of these mechanical philosophers 55

CHAPTER II.

Energy in Bergson's System.

A.

1. Bergson's Problem 57
2. The view that traces mutability to some other point in space 58
3. What Bergson thinks of an infinite universe 59
4. The theoretical conceivability of the hypothesis that stability and instability succeed each other ... 61
5. Bergson's standpoint 62

B.

6. Relation of matter with space ... 63
    (*a*) Bergson's erroneous idea about space 64
    (*b*) In what sense can matter have duration? 65
    (*c*) Bergson obsessed by the crude notions of science ... 67
7. Their relation to mind 69

PAGE.
(*a*) Misconception about the nature of consciousness... ... 70
(*b*) Can the mind represent to itself its own extinction? ... 72
(*c*) Confusion of qualitative sameness with qualitative difference ... 73
(*d*) Can cosmology be a reversed psychology? 74

C.

8. Vital Force, the source of all mutability... 75
9. Its pretensions unmasked ... 76
10. The unification of matter and energy in the vital force 79
11. False and misleading images ... 82
12. Further absurdities about Bergson's conception of energy 84
13. The finitude of the vital impulse incompatible with its immaterial nature 86
14. More glimpses about the vital force:
  (*a*) Possibility of life and the point of inversion 90
  (*b*) Can life be absent anywhere? ... 92
  (*c*) Where we should expect fullness of life, Bergson sees a vague vitality, a dream existence ... 93
  (*d*) What is vital force in and by itself? 94

PAGE.
15. The identification of life with consciousness 96
16. Conclusion 100

CHAPTER III.

Problems of Motion.

1. Why we consider motion ... 101
2. Meaning of continuity 101
3. Can continuity be objective? ... 104
4. The sense in which Bergson regards it as subjective 106
5. The stand-point of common-sense ... 110
6. Analysis of the phenomenon of the uplifting arm 111
7. Our paradox, and how it can be solved ... 113
8. Whence then the idea of motion? ... 115
9. The correlation of motion and rest ... 118

CHAPTER IV.

Problems of Motion *(Continued).*

1. Absolute motion 120
    (*a*) Lotze on its possibility ... 120
    (*b*) Such motion is already relative ... 122
    (*c*) The sense in which we understand the relativity of motion ... 123
    (*d*) Meaning of a change of place ... 125
    (*e*) Consciousness is the only truth of the correlation ... 126

PAGE.

2. Degrees of Mobility:
    - (*a*) The measure of time and space ... 128
    - (*b*) On the hypothesis of time as conscious duration 129
    - (*c*) Zeno's paradox in the light of this problem 131
    - (*d*) The proposed qualitative interpretation of mobility cannot solve the paradox 135

3. The beginning and amount of motion ... 137

4. Persistence of motion 141
    - (*a*) This is not a separate problem: it is only the problem of the occurrence and the reality of motion repeated in another form ... 145
    - (*b*) Persistence is intelligible in the nature of the consciousness alone... 148
    - (*c*) Significance of the law as formulated by science 149

5. Lotze's idea of motion on the view of phenomenal space 151
    - (*a*) A qualitative mark necessary for any arrangement of phenomena in space, and the possibility of the appearance of motion ... 152
    - (*b*) This mark only possible for a consciousness united to an organism 154

PAGE.
(c) The semblance of motion is the only motion we know; but it has no meaning unless the correlation is resolved back into self-consciousness ... 154
(d) Solitary motion impossible: Lotze unconsciously introduces the rejected co-ordinates ... 158
(e) Can a thing be conceived as having an unspatial history of inner states? 159
(f) A *state* cannot explain persistence or inertia of motion: Lotze's admission 162

CHAPTER V.

Meaning of Efficiency.

1. Relation of the idea of energy with that of some activity or motion ... 164
2. A thing cannot move itself: the cause of its movement must lie ouside it ... 165
3. Nor can one thing move another ... 166
4. No sense of power in outside change: we go from one static thing to another without end 166
5. We are directly conscious of power only in our own activity 167
6. The distinction of agent and patient ... 168

PAGE.

7. How can movement be produced from two immobilities? Any interaction between the spatial and the unspatial inconceivable 169
8. Analysis of an act of will ... 170
9. No sense of power from perception right up to the completion of the whole set of bodily movements involved in the particular act ... 170
10. Was there any such sense when the process was just begun? ... 172
11. The sense of 'can' 172
12. The meaning of this 'can' should be sought in our spiritual nature ... 173
13. Can power be limited? 174
14. The evidence of our consciousness points to the unlimitedness of our nature ... 174
15. What we understand by an instrument and its limitations 175
16. Example from vision 176
17. Are we not moving within hopeless inconsistencies? 177
18. The unlimited is the only meaning, and the only truth 177
19. The true sense of Power 179
20. Conclusion 179

INTRODUCTION.

Scientists and philosophers agree to regard the world as a manifestation of energy. But few of them understand what they exactly mean by energy. Most of them use this word only to cloak their complete ignorance as to the nature of the cosmos. The scientist thinks that he knows energy in the various phenomena of the universe, and that its reality is beyond doubt or dispute; he wisely, however, refrains from giving any spiritualistic connotation to it; it is the ground of the world outside, and he is satisfied with this explanation.

Some philosophers, with a poetic temperament, go much farther; they conceive it to be the spiritual force of the highest reality, God or the Absolute. 'The universe is a manifestation of the energy of God, the infinite joy of the divine',—this is their creed.

The scientist has his work easy. He appeals to our experience which shows change and motion; these, he argues, could not be possible without real cosmic energy. Reserving for the present a fuller consideration of these notions, we may here only note some of his admissions. He admits that there is no *direct way* to approach energy, and that all that we are given to know about the universe is a series of varying views in time; energy is a *postulate* of this variation, and will be an impossible notion in a world of completely static elements. On his own admission, therefore, he approaches energy from the outside, through the senses and the intellect. The senses and the intellect do not see energy; they see definite phenomena or things. But these do not stay in their nature,—they are succeeded by other phenomena. Thus the universe is reduced in our knowledge to *a series of sense-impressions succeeding each other*. This is the best and the most conclusive proof to the scientist for the reality of energy; for how otherwise could the world change and produce in us corresponding changes of impression? † Nature is endowed with Power, essential Power!

The poet-philosopher shows much greater confidence, though he has less *evidence* to hold forth. His chief strong-hold is his condemnation of formal reason as untuned to catch the higher harmonies of the divine nature. Sri Aurobindo Ghose holds this view. We have already shown in a separate criticism of his articles on 'Individual and Absolute' appearing in the Ârya issues of June and July 1917, that though reason is unable to grasp the Real, an intuitive or a poetic experience of the energy of God in the cosmos, only *dimly* and *indirectly* anticipates the nature of the true reality. We need not undertake this criticism here again, though the attitude which we have adopted in this book will naturally supply a complement to what we have already said.

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† Here it will be noted that the scientist is led to the notion of energy, because he conceives nature to be necessarily continuous in fact and meaning; otherwise, the only thing he is given to know is a series of discontinuous views.

It will be well here to set down the Advaitic stand-point in a few and simple words to supply a key to the discussions that will follow; although, we must remember that our treatment must necessarily be inadequate and fragmentary in character, for a proper understanding of any aspect of Advaitism naturally leads to its other aspects and the raising of many disputed points. We shall take here a passing notice of three aspects of our question. (1) The possibility of a static universe, (2) our experience of change, and (3) the meaning of energy.

The scientists admit that the conception of energy would be impossible in a completely static universe. Now what is meant by a completely static universe? Naturally, a universe in which change in every form, either as motion indifferent to things, or as qualitative variation of things themselves, will be out of question. Is such a universe possible? Some might argue that the possibility and the impossibility of such a universe is not a matter for our argument or decision. We happen to see the universe changing; and therefore a changing universe is real and possible. It is quite conceivable that change may disappear from the universe, and things might thenceforward continue in their own place and respective natures; a static universe will then be equally real and possible. At least there is no inherent necessity why the universe should change, or why it should not. It is a matter for the universe to decide, and when it does decide it finally and definitely, *the reality of a static universe will be the proof of its possibility.*

The argument appears quite plausible. But it is based upon a fundamental misunderstanding about the nature of the universe. Objectively, it is equally conceivable whether the things as they appear to us are brought about by the forces and the energies of the scientist, or as the immediate creations of a static and immobile substance that renews them every moment. The one is as mysterious to us as the other; we know neither how mobility can become immobile appearances, nor how immobility can become mobile in an *act* of creation. We are not here interested in the *how* of things. What we are concerned to ask is, whether, granting their possibility, they can have any meaning in knowledge or constitute a universe, when all change has been ruled out. Or, to put it more clearly, is there any *inherent impossibility*, *i. e.* impossibility of meaning, in a completely static universe?

Having eliminated from the universe all changes including the motions of the body, and those of the different organs and the nervous elements, we must postulate, in order to conform reality to meaning, the reflection of this static universe into an immediate consciousness, unencumbered by an organism, yet with a possibility of knowing the world as it is, *i. e.* catching the qualitatively different views of the world, represented by the different objects or phenomena of the universe, and commonly associated with the offices of the different senses. Such a consciousness must see things as they are,—red as red, blue as blue, two feet distance as two feet and so on. Since it is an immediate consciousness, unencumbered by the limitations of an organism, it must be able to see the whole universe together in one moment,—which may well be described in this case, as a moment of eternity; *we* catch only a particular aspect of the universe in one moment, because we have to *move* our organs in space to get our impressions. But a really static universe, necessitating an immediate consciousness, can only have one time and one consciousness of all things. Is it, however, conceivable that red and blue, and all other heterogeneous qualities of things, can exist at the same time in one consciousness? No doubt each colour gets its form by an unconscious comparison with other colours, especially the colour of the background; but still, unless we are loath to take experience as our guide, only one colour is explicit at one time; we cannot even *conceive* how red and blue can exist together in one consciousness.

Some might argue that the limitation of our consciousness must not be attributed to an all-knowing immediate consciousness. But if we are to be guided by our experience, and have to deal with meanings rather than words, we must at least be able to conceive the *possibility* of such co-existence. On the contrary, our experience distinctly points to two successive moments in the consciousness of red and blue; nay, the moment we have qualitatively different views, we have succession in consciousness, and time has received its form. If we do away with succession and so time, as we must in an immediate consciousness, red and blue and all other qualities joined with them will cease to exist at all, instead of appearing together. The qualities which remain qualities only by their limitations of form in time, can never remain those qualities when those limitations are taken away. The red gets its particular quality of redness by *not being blue*, *yellow*, *orange etc.* How then can it co-exist with its innumerable 'nots' in one explicit consciousness?

It might still be urged that these 'nots' are necessarily 'implied' in its explicit consciousness, and in that sense, it co-exists with them all. But this only proves that the particular quality gets its 'specificality' from these 'implied' nots, and cannot retain it the moment these 'implied nots' themselves become explicit, as they must, in an immediate consciousness which sees all things first-hand, in every supposed moment of time, without distinction or partiality for a particular quality. Such a consciousness has no *reason*, nor even the *possibility* of dissociating reality into 'implied' and 'explicit'. Everything must exist in it in one moment of explicitness. How then can the different qualities retain their specificality, which is necessarily bound up with the above distinction and a time broken up into successive moments? If we give back to time its real continuity, and resolve moments into a unity of consciousness, there will be no *possibility* for the perception of qualities; qualities will cease to have any meaning, which is the same thing as to say, that they will cease to exist.

The perception of distance by this immediate consciousness presents still more interesting considerations. If a thing always appears the same, as it must to this consciousness, and all measurements by movement or muscular effort are ruled out, there is no possibility of any perception of distance at all. The immediate consciousness will know no difference between the 'nearer' and the 'farther'. We recognize distance by a system of qualitative changes in the view of objects, resulting from their relative displacement in the field of our vision; and it is literally true that distance measures a continual perversion of objects, in respect of their sizes and presented aspects.

This lack of appreciation of distance, on the part of the immediate consciousness, will react upon its perceptions; for, in the universe of our experience, the character of each perception is dependent upon its distance; and where distance does not enter as a factor in any sense, no specific character can be assigned to a perception; perception will cease to exist. Objects in a picture have no distance from each other in one of their dimensions, namely depth. A landscape differs from a picture in this respect;

it has a *background* which remains relatively static, and is thus conceived as farther away. All pictures have *meaning* on the assumption of this real life-like landscape. Our universe is made up of objects which appear *such and such at such and such a distance.* When we have taken away distance, we have taken away such and such a view,—and with it every view altogether. The immediate consciousness can at best coin one standard view of its own for every object, but even then it can satisfy itself alone, that that view represents no distance and yet refers to a real object outside.

A still more interesting consideration presents itself to us here. Every object has its obverse and reverse. We see only one side of a thing at a time; and yet in this perception is necessarily involved its other side; we cannot even conceive an object or a perception without a back or its other side. And yet how is this all-knowing immediate consciousness to bring both sides together in one perception? The very nature of perception, *formal* in character, forbids it. Besides, if distance is abolished, with it will have to be abolished all dimensions of space too, and the world in which this consciousness will find itself, will not even approximate to the flat world of our geometry; for even geometry, with its ideal definitions, will not, perhaps because it cannot, abolish the distinction of 'obverse' and 'reverse' with regard to its images. But the immediate consciousness is called upon to achieve even this impossible task. In short, *a static world, getting meaning only in an all-knowing immediate consciousness, can be world in no sense.*

We have already seen that qualities can have their specific form only in time; we cannot perceive a diversity excepting in successive moments; and this experience of ours is the only meaning we can attach to a world. Change is the form under which alone perception is possible. But what is it that changes? Is it the world outside us, or time, or our consciousness, or all the three put together? Whatever may be the reply to this question, we know one thing for certain, that the meaning of the world is no longer to be sought in an immediate consciousness, but a consciousness as we know it, bound up with an organism and working under its limitations. It is conditioned by the instrumentality of the senses, and is only able to see different forms in succeeding moments of time. This means that our world is composed of forms, having spatial determination;† and that, these forms to be forms at all, must occupy successive moments of time; they are intelligible and possible only in a universe of change.

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† Spatial determination here must not be taken in the narrow sense of a visual perception; anything that can be grasped by any of our senses, and has, as such, a form or limit, must be conceded spatial determination.

If, then, the meaning of the world is to be sought in our consciousness ridden by time and space forms, and not in any all-knowing immediate consciousness, the meaning of change can only lie in our experience of succession. It is another question whether this succession is guaranteed by an objective change in the world itself, or it is purely subjective, or again neither. Here we have only to note that we cannot go beyond our experience of succession in determining the meaning of change.

We now come to our third point,—the meaning of energy. We grant for the present that there is real change outside, a succession of forms,—one view, a second view, a third view and so on. But what makes them *successive?* If each form were a unit, complete by itself, it will be independent of all other forms, and its own sufficient explanation; succession will have no meaning. But we have already seen that a form can have its specific character only in a comparison and *by its place in a time-series;* a world of static elements is inconceivable and impossible. If then we go to the world outside for change, we shall only be able to see static forms, without that in which they get their succession and so meaning; the very paraphrase of the expression 'to be outside' is 'to have a static form', 'to be a definite this or that'. While, on the other hand, succession requires that in which the succeeding moments or succeeding perceptions are one. Mere succession, without this unity behind it, can never have the form of succession; it will be a number of discrete points, a universe of static elements, that has no meaning, no possibility. The true meaning of change or succession must therefore be sought not in the world outside, not in the succeeding forms of the mind which partake of the same world,—but in that timeless unity which explains change without itself changing, and gives form to perception without itself having any. Such is the unity of consciousness, our true nature. It cannot change, because *change postulates It;* it can have no form, because form gets its meaning from It; it cannot be in time, for moments or succession point back to It; it cannot be 'inside' or 'outside', for 'ins and outs' are mere forms of space dependent upon It. Thus we find that *the true meaning of change cannot be found in the world outside*, or *the mind,—but in the unchanging Self.* We do not know what we mean,—for really there is no meaning,—in saying that the world or the mind changes. The truth of change is the changeless Self. And if the question is raised, Whence this change, How is it that we see it and believe in it?, the only reply can be, there is no change, you do not see it; and still if you think you see it and that your belief is unquestionable, you see and believe in a meaningless, self-constructed or sense-constructed, myth.

Even granting that there is real change outside and so real energy, this energy can only be conceived as different from matter and moving it. But wherever we have two reals, we must necessarily think of them as formal in character, limiting each other, and thus conforming to our idea of 'things'; and things are by nature *inert.* If, then, energy is the 'other' of matter, the *sense* in which it is differentiated from the latter will prescribe to it its form, which, like every other specificality can get meaning only in change, that it itself was designed to explain. Energy will itself become a thing, and cease to explain change in which things get their meaning; or, what is the same thing, the purpose for which energy was conceived to be different from matter will be frustrated, and it will be found, on examination, that no real distinction exists between our meaning of the two terms. Whatever we place outside ourselves as an object of knowledge, can have only *one* form of existence,—that prescribed by the senses and the intellect; we can never have any *real distinction* in the objective world, a distinction of kind; but if we want to get at this, we must find out a way beyond our common notion of existence to That which is never an object of knowledge, but rather, in the light of which, all other things appear to exist, move and have their being. This is our true Self.

Still, supposing, that energy is a formless and immaterial reality outside us, how are we to conceive it as moving matter? We know the contact of matter with matter,—and all our notions of motion are based upon this contact. How is energy, itself immaterial, to initiate a movement? It must act upon matter in some place, seek points of rapproachment with it. How is it to achieve this, and leap over the gulf, dividing it from an absolutely different reality like matter? No scientific acumen can solve this problem, the very postulates of which are absurd. And yet that bold thinker who can ride over all impossibilities, will only succeed in reducing the moving force or energy to a kind of stuff, however subtle; in the rising arm or a moving engine, we shall begin to perceive animated fluids or particles; this is the *only* image that will swim to our sight the moment we conceive energy as moving matter. But once energy is thus thought of, it ceases to explain motion, and leaves the problem where it was; it has itself become a kind of stuff or substance, and no notion of stuff or substance can accommodate itself with the idea of self-initiating movement.

'The universe is a manifestation of energy', not because it is the creation of a subtle fluid that is continually manipulating or changing it; nor because, by a poetic exuberance, the conscious rhythm of the highest reality has transformed itself into things and activities; but because, change is the form of the universe, and the true meaning of this change which we seek to denote by energy, can only be found in that changeless Self, that pure Consciousness, the ignorance of which assumes for us the form of a universe of manifold things and motions.

CHAPTER I.

Energy in Physical Sciences.

The stand-point of mechanics.

All modern physical sciences agree to repudiate the substantiality of the forces of nature. Mechanics which is a science of motions of matter in bulk, indeed postulates forces; but unable to understand the nature of these forces or the substances upon which they act, it divests them of all real qualities, and reduces them to mere abstractions of mathematical imagination; it disowns the categories of causality and substance. The mechanical theory of the universe is thus obliged to sacrifice concreteness for exactness. It defines its notions, and like mathematics, does not measure and weigh, but starts with ideal conditions, and ideal weights and measurements, and then draws conclusions from these, which conform only very approximately to things outside. It is, therefore, as a theory of the universe, rightly called, abstract dynamics *i. e.* science of abstract motions.

Its method contrasted with its ambitions.

Now, if we want to study motions thoroughly, we must be able to detect the slightest displacements, such as those of the molecules, or better still, of the ultimate constituents of matter, whatever these are taken to be; nay, we shall have to go farther than that; we must trace energy to its ultimate source, find out its connection with the supposed constituents of matter, and lay open to our view the *inwardness* of all movement, perceptible or non-perceptible by our gross senses. The enormity of the problems involved in this determination can hardly be imagined when we remember that the slightest displacement requires for its complete explanation not only the movement of the neighbouring parts, but that of the whole system of interconnections represented by the universe. To understand completely the slightest movement, we must have the *secret* of the whole universe open to our eyes. This secret does not only involve the relative movements of the ultimate constituents, taking the universe to be a closed system of such movements; for it is no explanation to advance one movement as the occasion or the cause of another, and so on in a final circle of mutuality; we must break this circle somewhere, and catch the meaning of motion in the ultimate nature of energy, matter, their connection, and the first law ordaining all movement. The task is impossible and beyond the very scope and ambitions of a physical science. Our conception staggers before the problem; where is room for mathematical reasoning whereby abstract mechanics would try to explain and foresee every movement of the universe?

Mathematics moves in its abstractions, defining one thing in terms of another; postulating ideal weights and measurements that have no relevancy with the actual and the real world of our experience; creating fulcrums and balances that have no absolute value, and are true only relatively to arbitrary standards of reference and within arbitrarily closed systems of movement. How can mathematics solve the problem of this immensity, the visible universe, when it cannot, with its abstractions, even approach it? Wisely, therefore, has modern Dynamics given up its ambition of explaining the universe, limited the generality of its questions, and concerned itself with the practical aspect of the problem satisfied with merely approximate determinations.

Meaning of matter and energy in mechanics.

Mechanics does not directly answer our questions,—What is matter? and What is force? It regards matter as that which can be moved by the application of force; that is, it does away with all the physical properties of matter, and reduces it only to the conception of mass; and mass is that which is moved by force. But the idea is still incomplete. A mass cannot be a mass, unless it enters into a system of masses and thus gets its relative value. A mass must be weighable; there is no absolute mass, but only determinate masses; and this means that it must be calculated in terms of some other known mass; this mass again will require another, and so on *ad infinitum.* What is then the true determination of mass? Unable to solve this question, mechanics shifts the burden to forces,—two masses are equal, if equal forces, in equal times, produce equal changes of velocity. And what is force? Evidently, that which moves matter or mass, for we have no other means of knowing its nature; we do not know *what* it is; we only know the amount of work done, (and the conception of work itself is correlative with it), and from this we determine its intensity or quantity; force is only a name for mass-acceleration, *i. e.* a number of units of mass, moved through a number of units of space, in a number of units of time; nowhere do we meet, in the conception of force, with any idea of *power.*

Its conclusion.

We thus find that the only fact of experience with which mechanics deals is motion, and from this it abstracts two correlative ideas, mass and force, and then measures the one in terms of the other, while relegating the study of their specific qualities to other sciences. But we must remember that such correlative conceptions are both meaningless as correlatives. It is to explain one unintelligible by another, and this again by the first, in a circle of unintelligibility. Yet this *impasse* emphasises the fact that the truth of motion can only lie beyond these mutually destructive conceptions, in a reality whose meaning cannot be grasped by an intelligence that can only think correlatives.

The stand-point of Physics.

Physics like mechanics disclaims real forces. F. Soddy in his book on Matter and Energy, says. "Early writers, when they really meant what is now called energy, often used the term force......The very idea of force is, however, what would be termed an anthropomorphism, that is to say, it ascribes the behaviour of inanimate objects to causes derived from the behaviour of human beings. We have come to associate the motion of matter with somebody or something pulling or pushing it." † Physics also repudiates the abstract force of the mechanical theory. It studies concrete phenomena and *specific* energies (also called natural forces), such as gravitation, light, heat, electricity, and chemical attraction. But where it gains in concreteness, it loses in exactness; for, as the history of the development of the physical science shows, the theories about heat, electricity etc. have had not only to be re-adjusted from time to time, but are open questions even at present.

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† Matter and Energy, by F. Soddy; Home University Library, pp 19–20.

The inherent uncertainty about all theories.

The uncertainty hanging about these theories is quite natural. The very formulation of theories points to our ignorance. That which is a certainty and a fact can never give rise to a question. We question in doubt and ignorance; and a theory has meaning only so long as there is a *standing* question. No doubt the progress of science is continually transforming theories into facts; but such facts are facts only *relatively* to a more general question; the theory changes its form and direction, but never its abstract and doubting character,—it only shifts the burden of solution from one quarter to another. This must necessarily be the case, when we remember that every theory is based upon certain conditions or postulates which it leaves unquestioned; it isolates a particular *aspect* of phenomena into a separate universe; this necessitates a limitation of the problem, which is the same thing as to say that it takes certain facts for granted. And all our facts partake of this nature,—they are so many assumptions, necessary for the formulation of any question, problem or theory. We do not know any absolute fact, any item of our experience which is completely self-explanatory. And it is literally true that in order to understand the smallest fact, we must know the whole universe of which it forms a part or an aspect. The truth is that the universe of our experience is a universe of doubts, questions and assumptions, and within this, a *real* fact has no place.

Examination of some theories of Physics.

The theory of gravitation can pass off as an explanation of actual phenomena, only for those persons who are satisfied with the shallow utilitarian stand-point of science. What is the real nature of the force or the kind of attraction between objects, we do not know; the law of gravitation is only a formulation of a relation, and not an explanation of facts. Heat is a certain motion of molecules. But what is the nature of this motion, we cannot say; nor can we find any *connection* between such motion and the physical sensation we call heat. Again electricity is known to be a certain movement of minute electric corpuscles; but it is not given to us to know the nature of this movement and the nature of these corpuscles beyond their evident, and sense-verifiable results. In short, physics is unable to understand the *nature* of the specific energies; its theories in this respect do no more than postpone the question; they cannot close it; *for whatever might be postulated as the final basis of phenomena, will still be amenable to doubt and question, and surprise us with its mystery not the less.* The very nature of the line of investi-

gation is such, that it can *never* be satisfactorily closed. Any possible fundamental fact *outside*, will neither explain itself, nor the variety of phenomena it is supposed to give rise to.

The theory of one substance.

The progress of science has been so rapid lately that it is seriously put forth that the ultimate basis of all changes of quality must be sought in one substance, the electrons and their varying relative movements. The article on Science in the Encyclopeadia Brittannica, contains the following passage: "In 1897 Thomson discovered that in certain cases, the moving particles which carried the electric current were of much smaller mass than the smallest chemical atom, that of hydrogen, and that the minute particles, to which he gave the name of corpuscles were identical from whatever substance they were obtained. They enter into the structure of all matter, and form a common constituent of all chemical atoms.......It is impossible to resist making the speculation that the whole of an atom is made up of electrons, and that mass is to be explained in terms of electricity." † But the nature and the power of these electrons is a greater wonder to us than the facts of our experience which these electrons seem to explain. Can we *rest* in such an explanation? Again, if homogeneity is at the basis of heterogeneity, *between which science can show no necessary connection*, the latter becomes more mysterious than before. If electrons and their movements are the only reality, then to the eye of the all-seeing scientist, the different qualities of form can only be illusory. The same will be the position of the scientist who wants to explain change of qualities by different spatial adjustments of permanent and unchanging molecules of various elements. The attempt to explain heterogeneity by complete or partial homogeneity, only means that the phenomenon of mirage is the type of all reality. There, the unchanging sand-particles and the sun's rays are the real substance, and the appearance of water can in no *real sense* be connected with these; the latter can only be attributed to the limitation or the perversion of our senses.

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† Vol. 24, p—402.

The tenability of ascribing specific characteristics to energy.

Without however going so far with the speculative scientist, we may reasonably question the success of physics in unveiling the nature of specific energies. If we divest natural forces of the phenomenal mark, or the curtain of sense-impressions which are evidently irrelevant to them, physics has no means of distinguishing one energy, in and by itself, from another. All kinds of motions, attractions and repulsions, are homogeneous in the idea of energy; the specific qualities are attributed to them by our senses. There is no specificality in the notion of energy itself. Wundt, therefore, simplified the problem by reducing all change to mere change of place, and rendering thereby physics homogeneous with mechanics. We cannot conceive a change of quality; for, every change requires a substratum, a permanent something that appears to change,—and in a change of quality, any substratum is lacking; while, we can more easily conceive motion, for the object moving remains the same throughout. Prof. Mach is quite correct when he argues, in his Popular Scientific Lectures (p 159), that the reduction of all change to mere change of place does not solve our problem. He says, "After all, do we really know *more* why a body leaves one place and appears in another, than why a *cold* body grows warm?" Indeed, the 'why' of both is equally mysterious as we shall see later; but there is a difference in the nature of the respective changes. We can conceive a moving body, for the body is a fixed something; but we cannot conceive a quality changing into another quality, for the gulf between their respective *forms* is absolute. If we can conceive the gulf as bridgeable, one form melting into another by slow degrees, we shall get a *continuous series*, (if such an expression can have any meaning), in which no quality can be what it appears to be, for the simple reason that a movement or a true continuum is not a set of forms or things. There is no meaning in 'preceding' or 'succeeding' except in an understanding which creates qualities by its static habits; and once we move within these, we can only *leap* from form to form. Even two shades of the same colour cannot be continuous; for, a shade is static, and cannot move or become another; and yet, the law of continuity requires that a shade or a quality *must become another consistently with itself*,—an impossible demand.†

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† Lotze, in his Metaphysics (p 359), makes a distinction between the change of one quality into another, and that from one shade of the same quality into another shade. He says, 'Of course the application of the law of continuity is not attempted where disparateness between two extremes excludes all possibility of a path leading from one to the other in the same medium. No one conceives a musical note as changing continuously into colour; a transition between the two could only be effected by annihilation of the one and creation of the other anew; but that negation of the note would not have the import of a definite zero in a series such as could not but expand into colours on the other side of it....' The fallacy of this distinction is quite evident when we remember that every form, even within the so-called homogeneous medium is static, and discontinuous as a form; his mistake is due to his conceiving continuity as objective; *see chapter* III.

Either, therefore, we must do away with the notion of one quality being continuous with another, or with the notion of qualities altogether thereby making change quite meaningless. Change requires something that persists through it, and a qualitative change does not warrant that something. Prof. Mach is thus unaware of the philosophical issues when he continues, "Granted that we had a perfect knowledge of the mechanical processes of nature, could we and should we, for that reason, *put out of the world* all other processes that we do not understand?" We must, indeed, put all such processes out of the world, if our world is to be our knowledge-world or thought-world. When a qualitative change challenges the most fundamental laws of thought, we cannot even formulate our problem with regard to it. Science is, therefore, *obliged* to accept a mechanical basis for all qualitative changes; it only knows homogeneity, fixed atoms and their motions; the heterogeneity is connected with these by a sort of *marriage de convenance.* Prof. Mach recognizes this mistaken attitude of science, but can offer no solution of his own. He says, "Intelligible as it is, therefore, that the efforts of thinkers have always been bent upon the 'reduction of all physical processes to the motions of atoms', it must yet be affirmed that this is a chimerical *ideal...*" Chimerical no doubt it is, but this is because all science is chimerical; and we shall the more gladly re-echo his conclusion, coming as it does from a distinguished scientific thinker, when he says, "Physics treated in this sense supplies us simply with a diagram of the world, in which we do not know reality again. It happens, in fact to men who give themselves up to this view for many years, that the world of sense from which they start as a province of the greatest familiarity, suddenly becomes, in their eyes, the supreme 'world-riddle'." Science is incapable of solving this riddle,—let Prof. Mach save it.

The problems of homogeneous energy alone relevant to science.

The investigation of qualities, therefore, is not in the spirit of physical science; the relevant problem for it is not *specific* energies, but energy that is described as 'accumulated mechanical work, which, however, may be only partially available for use.' * It is this 'capacity for doing work,' *—and 'the work done varies as the resistance overcome and the distance through which it is overcome conjointly,'—to which all forms of energy are reducible, and which lends itself to scientific investigation. We shall now proceed to examine the problems of this homogeneous, measurable energy which alone falls within the province of science.

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* **Encyclopeadia Brittannica, article on energy.**

Energy diffuse and available.

The distinction between diffuse energy and that which is available, can be easily understood from the following passage; "the forms of energy which are most readily recognized are ofcourse those in which the energy can be most directly employed in doing mechanical work......hence when useful work can be obtained from a system by simply connecting visible portions of it by a train of mechanism, such energy is more readily recognized than that which would compel us to control the behaviour of molecules, before we could transform it into useful work". † Energy which can be utilized is available; but energy which cannot be utilized, requiring molecular control, is diffuse and unavailable for our purposes. The distinction is only practical, and is unimportant excepting as a further item of evidence to show the unity of our conceptions of energy and work.

Potential energy.

The distinction between potential energy and the kinetic is thus laid down in the Encyclopeadia Brittannica:—"The energy which a system possesses in virtue of the relative positions of its parts or its configuration is classified as 'potential energy' to distinguish it from energy of motion; it is stored away in some latent manner and can be drawn upon without limit for mechanical work." This distinction is very important as it shows that the conception of energy is completely relative to our use, and has meaning only in work. How otherwise could the so-called potential energy, which is absolutely indistinguishable from a state of rest, be called energy? We see energy there, only in view of the later work that is done for us. We think we can imagine energy going to sleep, or being stored away in some latent manner. But energy that can sleep or lie latent, how and in what sense is it energy? Those who deal with meanings rather than words can easily answer it.

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† Encyclopeadia Brittannica, article on energy.

Energy must be in continuous effort.

Some, with a truer intelligence, picture every state of equilibrium as a real war between counter forces that are only apparently at rest; they conceive a stone resting on a wall as always pressing against the latter, always about to fall,—its place about to give way; energy is in a continuous effort. But pressure or tension can have meaning only when the elements in opposition are free to move in space. Neither, however, the stone, nor the wall it rests upon, are in any sense free. They form parts of a compact system, the earth, and can only move when their compactness has been broken by causes other than those by which they are in equilibrium. If then, they have a compact setting, they cannot press against each other; but, if they are free to move in space, all talk about potential or sleeping energy is meaningless.

The question considered from the molecular point of view.

This becomes more evident when we consider the question from the molecular point of view. The stone has potential energy; but so also has each atom and particle of the wall, and it will not be wrong to say that the stone forms a part of the wall. This pressure of atom upon atom can be continued from the top of the stone right up to the centre of the earth. And yet, if we are to judge by the behaviour of visible masses, each atom must transmit the pressure upon it to the next below it, and find its own place of rest. From one end of the globe right up to the other, we shall find no evidence of any struggle going on indefinitely; we can easily conceive an atom falling to any depth under pressure to find its place of rest; all motions of nature tend towards equilibrium. This is the basis of the law of impossibility of perpetual motion, and is easily verifiable in the case of visible masses: for, in the real world, every force is bound to spend itself up in doing work, *i. e.* in overcoming resistance. The limit of this work will represent inertia or a state of complete rest. If we conceive the result of this work continued by new forces perpetually, we shall get unceasing motion, or the kinetic form of energy only. We must, therefore, either accept this and give up potential energy, or accept the law of the impossibility of perpetual motion and regard every form of potential energy as a real state of rest representing the exhaustion of all driving power.

No ground for potentiality anywhere.

Another point may also be noted here. It is only in the separation that the earth and the stone evince energy; and then it is as true to say that the earth was resting on the stone as that the stone was resting on the earth. Yet we do not say that the earth was endowed with potential energy relatively to the stone, though theoretically it too must be conceived as advancing to meet the stone † ; we say the stone rested on the earth and was endowed with potential energy. The arbitrariness of this assertion is quite evident, and throws light upon the utilitarian way of our judging things. If, on the other hand, we get behind the moment of actual separation and regard the stone as merely resting, it forms a part of the earth, and is only endowed with energy in the same sense in which every particle of the earth is endowed. In the former case *i. e.* separation, we have kinetic energy only; in the latter, a system which acts as a unit in the mutual gravitative relation of its parts.

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† The following passage from Lotze will be interesting in this connection. It points out that our experience fixes upon one element as moving and keeps another as relatively static only because of the practical advantages of such an attitude; otherwise it has no warrant either in itself or in abstract reasoning for such distinction. "This possibility of interpreting what to our perception is the same result by different constructions continues to exist most obviously as long as we look exclusively to the reciprocal relations of two elements without regard to their common environment; nor does it cease when we consider the latter also; only in that case the possible constructions will not all seem equally appropriate. We should prefer to regard as in motion the element which is alone in altering its position relatively to many which retain their reciprocal situations; still there is nothing to prevent us from conceiving that one as at rest, and the whole system of the numerous others as moving in the opposite direction." Metaphysic, p 370.

(The inherent meaninglessness.)

Lastly, we must remember that the expression 'potential energy' *is* a strange combination of meanings; if we retain the conception of energy, we can only conceive it as struggling and doing; and yet when we say that it is potential, we have allowed it to lapse into a slumber and thereby cease to be energy in any sense.

The conservation of energy.

We now come to another problem,—the conservation of energy. Energy was originally recognized only in mechanical phenomena; it was there, therefore, that the principle of its conservation received first recognition. When, however, the subtler forms of energy came to be converted into mechanical work, the principle was extended to the whole range of these phenomena. Prof. Mach, in his 'Popular Scientific Lectures', lays down the principle in the following words. "The most multifarious physical changes, thermal, electrical, chemical and so forth, can be brought about by mechanical work. When such alterations are reversed they yield anew the mechanical work in exactly the quantity which was required for the production of the part reversed. This is the *principle of the conservation of energy;* 'energy' being the term which has gradually come into use for that 'indestructible something' of which the measure is mechanical *work.*" This principle explicitly reduces all energy to quantity of work, and then it says that no change can take place without some work being performed, which work only represents the transformation of the energy spent upon it into potential form. It is argued that energy that is always in motion, and is always doing, can do no *work;* and *doing*, without any work done, is inconceivable. This is quite true; for, work absorbs energy, and energy that is always unspent, always moving and always doing, can turn out nothing substantial; its effects will cease to be the moment they are brought into being, which is the same thing as to say, there will be no effects at all; in short we shall have energy that is without any efficiency. Wherever, therefore, work is performed, the impossibility of perpetual motion becomes quite evident; we can conceive perpetual motion only in the meaningless dance of molecules, which do no *work*, for the very reason that they are *always* doing.

Conservation and the law of impossibility of perpetual motion.

According then to the law of conservation of energy, whenever work is done, a part of the kinetic energy of the moving body is transformed into the potential energy of heat by friction, and the available part spent in the production of the permanent effect. Anyhow, no part of energy is lost; it only changes its form; and if we could contrive a *perpetual process of reversibility*, we shall not only get the same amount of work for the same quantity of energy thus reversed, but we shall also have a phenomenon of perpetual motion. The possibility of such a contrivance is, however, doubtful. If it could be achieved, we can have a steamer propelled by the heat of the ocean, which heat it as readily returns to it by its movement. The difficulty is that we can never contrive a perfect machine which utilizes all the available energy for work; our machines are all imperfect and absorb some of the available energy. Where, therefore, a mechanism is involved in the reversing processes, dissipation of some part of energy is inevitable. A perfect machine can only be conceived as pure energy itself that does no work and can undergo no transformation.

Conservation implies homogeneity and independence of energy.

We have seen that the only proof of the conservation of energy is the measure of mechanical work; that all work involves the transformation of energy from one form into another; and that this transformation necessarily affects the availability of energy, in as much as all work is accompanied by a continuous process of energy—absorption: Now, if energy is a measurable quantity, forms or qualities will be quite foreign to it. Forms can have no measure, and where we have measure we have homogeneity. It is, therefore, meaningless to say that energy changes its form in doing work, for energy as such can have no forms and varieties. These are our sense—impressions, and can in no sense be *allied* to our conception of energy as a constant and creative something. Heat, electricity etc., may differ in the way they affect us, but we would not reduce them to common conception, energy, if we did not recognize in this, a specific and independent character irrelevant to all particular forms.

Such independence cannot be merely conceptual and abstract.

Some may argue that this will be raising the old contention of the substantiality and independence of our concepts. But while these concepts are always abstractions, energy occupies quite a different status in science; and it is owing to this status, that we conceive its conservation. What has conservation meaning, if not that of independence and a definite quantum?

We also feel quite sure that heat changes into electricity, electricity into heat, and so on. But this transition, understood as a transition of one form into another, is inconceivable as we have already seen; forms are necessarily heterogeneous. We think every change intelligible, because, consciously or unconsciously, we concede an independent ground to it which maintains the continuity behind qualitatively different forms. We need not here enter into the metaphysical import of such a ground in the world outside; the confidence and certainty with which we trace energy under different forms, determine its quantity and prove conservation, unmistakably point to our belief, conscious or unconscious, that energy remains unchanged through all forms.

The theory of conservation though based on that of work is really incompatible with it.

If this is true, energy cannot undergo any change in its kinetic character either, which is necessarily conceived as its true and proper nature. The kinetic energy changes into the potential and *vice versa* only when some work is done entailing a change of form of energy as that of mechanical work into heat. But we have seen that this change is irrelevant to it. Energy to remain homogeneous with itself therefore must do no work, *i. e.* it must remain a principle of action without doing any action; it must never *lose* itself, and work means loss.

The consequent dilemma.

Here is our dilemma. Pure energy, free of all formal associations, and as pure activity itself, can do no work, and ceases to be cognizable as energy; for, our conception of it is correlative to the conception of work. The law of conservation becomes meaningless. If, on the other hand, we allow it to do work and so justify the law, it falsifies its own nature,—assumes irrelevant forms and passes into potentiality which is another word for non-energy. Either, therefore, the law of conservation is meaningless, or energy is meaningless. The fact is that there is a fundamental blunder in the scientific conception of energy as something real in the world outside.

Energy, as science conceives it, is a self-contradictory notion.

One more argument may yet be advanced by science to prove the validity of its own conception. It may be argued that work does not mean any formalisation or dissipation of energy, but only its division or diversion into other channels, without in any way affecting its character or its quantity. But division cannot be effected without a counter-force, and inertia cannot be understood as indifferent to the energy it divides. Here the difficulty is how to divide energy, when every opposing element that can assume the form of resistance must be included in its original stuff, if we may so speak of it. This difficulty is only augmented when we consider that any fixed quantum of energy must contradict itself; for, a quantum means a certain limit to its effectivity, but such limit, as a counter-acting force, cannot but be included within energy itself. Where and how can we draw a line between energy and non-energy, when the latter, by the very fact that it restricts energy, demonstrates its own effectivity or energy-hood? A quantum of energy is self-contradictory; and energy, as science conceives it,–a real natural existence outside,–must necessarily be limited and quantified.

The Law of Conservation cannot measure all the energy of the universe.

We may here note another peculiarity of the law in this connection. The law provides no method whereby to measure all the energy there is in the universe. This is so, by the very nature of the case; for, the working of a balance, or measurement itself, is possible only on the ground of a difference of energy,—how can energy, conceived as a generic stuff, be one of the weighing scales? In terms of what measure in the other scale, can this be achieved even if it were possible? All these considerations show the limitations of the law, and reduce it to a mere convenient assumption that can be elevated to a reality of nature only by the superstitions of an arrogant science, that refuses to analyse its own conceptions.

How Prof. Mach would prove conservation.

Prof. Mach in one place has given a very interesting enunciation of the law of the conservation of energy, and we shall do well to take note of it before we close this subject. He says, (p 164), "If we estimate every change of physical condition by the *mechanical work* which can be performed upon the *disappearance* of that condition, and call this measure *energy*, then we can measure all physical changes of condition, no matter how different they may be, with the same common measure and say: *the sum-total of all energy remains constant.*" Here, the only measure of energy is admittedly mechanical work. But this presupposes the measurement of work itself, which can only be done in terms of some other form of energy. What meaning is there in saying then that 'the sum-total of all energy remains constant,' when we can measure energy only in terms of energy?

Does measurement itself, even thus understood, convey any meaning? It is as true to say that we measure energy in terms of energy as that we measure inertia in terms of inertia,—a pound of ice in terms of a pound of iron. No doubt we commonly do this; but if we do away with the sensible qualities of things, and retain only their inertia, all weight or measurement would become impossible; for, inertia as such, cannot form a measure of inertia,—we shall have one term and not two. Supposing that the world of our inertia were made only of cotton of uniform density,—and we have a right to postulate this of pure inertia, since density is a quality of sensible objects and not of inertia as such,—would there be any possibility of weighing cotton? As a matter of fact, it is the difference in density, or the specific weight of things, that gives us our standards of measurement, and makes measurement itself possible; in uniform density, attractions and repulsions will also be uniform, and measurement in any sense will be out of question. Even supposing that pure inertia could be handled and weighed in its own terms, and that we had an ideal balance with an ideal fulcrum that measured weight without itself having any, and balanced forces without absorbing any part of them by friction or otherwise, we shall yet have to postulate besides this inertia uniformly pulling forces, (and this is not warranted by the difference, in any case, of their position on the surface of the earth, and the necessity of separating in space the scales of any balance). Here the all-important question is, is it inertia that has weight, or the forces that pull them? Or, to put it in the words of our own problem,—Does work measure energy or energy work? The law of conservation of energy is evidently based upon the former supposition, which is the same thing as to say that inertia has weight in and by itself, and measures energy in its own terms. The meaninglessness of such a view is quite evident.

Dissipation of energy.

We now come to the principle of dissipation of energy. The Encyclopeadia Brittannica contains the following passage on the subject. "...If a system be removed from all communication with anything outside itself, the whole amount of energy possessed by it will remain constant, but will of its own accord tend to undergo such transformation as will diminish its availability,—this is the law of dissipation of energy....The availability of heat increases with the temperature." Again it goes on, "In reality, no heat is lost, and no energy expended. The principle of the dissipation of energy has control over the actions of those agents only whose faculties are too gross to enable them to grapple individually with the minute portions of matter which are the seat of energy. Thus while we may conceive of no means of circumventing the principle of the conservation of energy, it seems that the actions of intelligent beings are subject to the principle of the dissipation of energy only in consequence of the rudeness of the machinery which they have at their disposal for controlling the behaviour of those ultimate portions of matter, in virtue of the motions or positions of which, the energy with which they have to deal, exists."

The meaning of the law.

This principle is based upon the fact that all mechanical work is accompanied by the production of heat at the points of friction, and that this heat is distributed by conduction till it finds its place in the ultimate sink of all heat-energy, the earth. Besides, mechanical work can be got out of heat only when there is a great *difference* between the temperature of two bodies; greater this difference, greater the availability of heat-energy. If, however, we have uniform temperature, all the heat-energy thus contained becomes unavailable for performing any work. This gradual equalisation of earth-temperature, and the consequent decrease of available energy is what is signified by the law of dissipation. Carnot showed that this irreversible heat-energy, or the entropy of the world, tended towards a maximum.

Conservation of energy is not opposed to its dissipation.

Prof. Bergson considers this principle as the most metaphysical of all the principles of energy; for, it supplies him with a clue to his idea of evolution and the genesis of matter. We shall consider this in greater detail in the next chapter. Here we must only note that dissipation is relative to our capacity for utilizing energy at a uniform temperature; thus it is not opposed to the law of conservation, but is rather complementary to it. Both these laws are necessitated by the principle that energy is work. Where the process is reversible, we have proof of conservation; where it is irreversible, we have dissipation.

The metaphysical issue involved in the law of Dissipation.

The metaphysical issue is quite clear. Energy can be conceived as available or non-available only when it is imprisoned in matter, divided against itself, and reduced to levels. The analogy of water doing mechanical work is very appropriate here. When water is at a high level, it turns out some work in falling. But water and the solid crust enclosing it at the particular level, are energy only in respect of their specific configuration or the *difference of level* from the earth. If we could manage to reduce the whole universe to a flat bottomless plane in every direction and thereby abolish every conceivable centre of gravity, (which is the same thing as to say that we should take our matter out of even single-dimensioned space), we shall have completely put an end to all attractions and repulsions; these come into evidence with a difference of level and the consequent creation of centres of gravity. †

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† How these differences of level are made in absolute space is an interesting question. We can here only suggest that these differences cannot be traced to original matter of uniform density. The attempt of some scientists to derive the whole cosmos with its particular configuration from such matter is quite fruitless. They explain formations of varying density by the attractions and repulsions inherent in this original stuff. But attractions and repulsions are rather the result of varying density than its cause. A uniform medium will be completely inert, and without the possibility in itself of combining in different degrees of density; it will not conform to our idea of ponderable matter at all. Another view which is at present finding some favour with the scientists may also be noted. They hold that mass is not a fixed quantity in the universe; there is no mass at all in the sense of inertness; it is another word for the intensity of force. If this be true, we shall get free forces working together; and density will be a name for the power of attraction or repulsion of forces between themselves. But such an explanation raises more difficulties than it solves. How the forces are divided, attract and repel each other, and act as forces at all will be beyond the imagination of the most extravagant scientist. Nothing is gained by reducing matter to force. We must take the difference of level as simultaneous with the difference of density,—and this can neither be derived from a uniform medium nor from mere force or forces. We must *begin* with the cosmos of varying density,—for that is the only cosmos we can think, know or reason about,—rather than try to get behind it; every attempt at further simplification is bound to be followed by greater complexity.

Levels of energy.

If now we analyse the meaning of a difference of level, we find that it implies the imprisonment of energy within non-energy, its division into camps, and the reduction of all work to a flow from the higher level to the lower level or from the more intensive to the less intensive. Water does work by falling because it represents a flow of energy from the less uniform to the more, from the higher level to the lower. Similarly, in the case of heat, we get work done by the flow of energy from a less uniform to a more uniform condition. Anyhow, *we start with levels of energy, and dissipation has meaning only in the disappearance of these levels;* we conceive energy as a subtle *substance* that can occupy positions, and be distributed, evenly or unevenly.

Example from heat.

Heat is not an absolute conception. Heat cannot be heat unless there is something relatively not-hot, *i.e.* unless there are degrees of heat; and it is this difference of degree that at the same time endows heat with energy; an absolutely uniform temperature, however great, can never be felt as any temperature whatsoever, and so a source of energy in any sense. From this point of view, the abolition of centres and levels is a real dissipation of energy. If our idea of energy is bound up with a difference of level and a flow from the higher to the lower, the absence of these levels and any possible flow, must necessarily mean the negation of energy in every appreciable or conceivable form. And yet, once we have started with energy at different levels, such negation can only signify the restoration of energy to its own nature, its complete and ideal integration. Strange as it may appear, we can think of energy only in points, centres, levels and flows, and every approach to its immaterial and truly integrated nature falsifies all our ideas about it.

A statement of the issues.

Our analysis of the problems of homogeneous energy has brought out the following issues: Can energy be only conceived as correlative of non-energy, and getting all its meaning from this correlation? If so, can such a notion of energy be satisfactory, *i. e.* as resolving the distinction in aid of which it was called forth, or what is the same thing,—as keeping energy, energy all the time and never confounding it with non-energy? And lastly, whether there is no ground out of this correlation, to pure energy itself?

Newton's attitude.

The mechanical school was obliged to face this question of the relation of matter and force. Newton regarded matter as made up of solid impenetrable particles;

but he could not explain their action at a distance,—it was a mystery to him; for he recognized only mechanical action, or action by actual contact of parts as in a machine. Accordingly, he contented himself with merely *describing* their motions rather than explaining them. He left the relation of matter and force to take care of itself, and proceeded with specific scientific investigations.

The solution of Boscovich.

Boscovich who followed him, reduced matter to a combination of mathematical points, endowed with inherent force. These points being themselves unextended could not come in contact with each other; they always acted at a distance. Thus Boscovich replaced the strictly mechanical notion of matter by an essentially dynamical one. There was no action by contact, all action was action at a distance. There was no real extension, for there were no primitive extended particles; extension was a result of *substantial forces*, and so also all other physical properties of matter. But forces can never be conceived as points; nor can it be conceived how these points affect each other; nor lastly, how extension can be made out of inextension. The attempt to materialize force, or to spiritualize matter is bound to fail.

Lord Kelvin united the above two views in his

Lord Kelvin's kinematic theory.

hydro-kinetic theory of matter. He showed that "There is no action at a distance; but then there is no empty space; action and reaction are to be explained, not by impact, but by the physical continuity of the plenum. There are no hard atoms, yet the atom occupies space dynamically and it is also elastic in virtue of its rotatory motion." † But such plenum, contradicting all our notions of grained matter, is indistinguishable from space; and the vortices by which Lord Kelvin tries to explain all physical phenomena can never occur in a perfect continuum.

If there was originally a perfect and undifferentiated medium of uniform density, we could never say that there was any motion, inertness, or even substantiality in it. Lord Kelvin himself recognizes this when he attributes to this so-called 'perfect fluid',—which may be conceivable by the kinematic ideal of geometry, but never by any conception of a concrete substance having a real surface,—the opposite qualities of inertia and perfect mobility. Again he says, 'There are no hard atoms; yet, the atom occupies space dynamically...........' Occupying space dynamically is a meaningless phrase. The atom must be a 'definite something' before we can even think of it as moving; and once it is that 'something', it has already occupied space; we cannot conceive mere motion; motion is always a motion of something. The fact is that a perfect plenum allows no room for the idea of an atom, which is a notion derived from our experience of grained matter. Yet without the idea of an atom, in an undifferentiated plenum, that is equivalent to pure space, the occurrence of motion is inconceivable. There will be *nothing* that can move, no gap in which anything may get in, no quarter from which an impulse to motion might come; all a perfect uniformity, unbounded, and may we not say, eternal in time? For, out of this plenum nothing can come,—at least anything that can affect it; that something will have to come from outside space, but the very fact that it comes, marks out its path within space. How can vortices take place in such a plenum? They must be there to begin with, with their specific formations of real grained matter; we cannot go *behind* them, nor explain physical phenomena *by* them. And once we accept this standpoint, there is an end to pure dynamics; we have no longer to do with mere mobility, but with *particles in motion.* Any attempt to resolve these particles further back into mobility, will bring us again to Lord Kelvin's plenum, with all its contradictions; it is inert and yet mobile,—as though these two attributes are compatible in any sense of objectivity. Prof. Ward has aptly described this kinematic ideal of matter as 'non-matter in motion',—which is the same thing as to say that there is neither matter nor motion, neither inertness nor mobility, no possibility of a continuum of that kind at all.

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† *See* Prof. J. Ward's 'Naturalism and Agnosticism', p 123.

Failure of these mechanical philosophers.

The relation between force and matter could not be diagnosed by these scientists. If they retained matter as inert mass, there was no room for force anywhere; for such matter could only be set in motion by contact of other matter, this in turn requiring a third member, and so on ad-infinitum. We shall have to go from inertness to inertness, without the possibility of alighting on force at any place. If matter was reduced to forces as by Boscovich, the nature and the behaviour of physical phenomena could not be explained; unextended points cannot make extension, nor mere forces interact; the very distance which Boscovich postulated between these forces showed that they had their spatial determination, however minute. Again Lord Kelvin's perfect mobility which is indistinguishable from perfect rest, cannot explain our experience of 'masses in motion'. This reduction of matter to mobility can no more conform to facts, than the reduction of mobility or force to matter. The idea of motion requires *both* these conceptions, and cannot be explained by any one of them singly. The mystery remains where it was. We make mass and force, matter and energy, without knowing either of them excepting as 'correlatives in our experience'.

CHAPTER II.

Energy in Bergson's System.

Bergson's problem.

Bergson has carried the relation of matter and force to a new field, the biological field, and has tried to give a solution in his own way. While discussing the metaphysical import of the law of the degradation of energy, he raises the question, Whence this mutability? For, according to him, change is the very stuff of reality, and unless a perennial source of energy is found out, the energy of the material universe, available at present, will, by slow degradation, disappear in course of time, and reality cease to be what it is. In his own words, "It (the law) tells us that changes that are visible and heterogeneous will be more and more diluted into changes that are invisible and homogeneous, and that the instability to which we owe the richness and variety of the changes taking place in our solar system will gradually give way to the relative stability of elementary vibrations continually and perpetually repeated." † Two answers have been proposed to his question. We shall do well to look into Bergson's criticisms of these first.

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† P 257 Creative Evolution.

The view that traces mutability to some other point in space.

One view traces mutability to other points of space. "We might at first suppose," says Bergson, "that it has come from some other point of space, but the difficulty is only set back, and for this external source of mutability the same question springs up. True, it might be added that the number of worlds capable of passing mutability to each other is unlimited, that the sum of mutability contained in the universe is infinite, and that there is therefore no ground on which to seek its origin or to foresee its end. A hypothesis of this kind is as irrefutable as it is indemonstrable; but to speak of an infinite universe is to admit a perfect coincidence of matter with abstract space, and consequently an absolute externality of all the parts of matter in relation to one another. We have seen above what we must think of this theory and how difficult it is to reconcile with the idea of a reciprocal influence of all the parts of matter on one another, an influence to which indeed it itself makes appeal." † It is indeed true that mutability cannot be conceived as coming from some other point of space; for, that will lead us from point to point, all borrowing it but none producing it; we shall thus only be postponing the question. So far

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† Bergson's Creative Evolution, p 257.

Bergson is correct, though even here we must note that the validity of the argument depends upon one postulate, namely, that there *is* a continuous stream of mutability in the universe, and that this mutability requires to be maintained by *fresh* supplies of energy which tends towards degradation, equalisation and unavailability. If mutability were taken as a passing phase only of the life of the universe, it will be a sufficient answer to our question to say that the present inequality of the distribution of energy is the cause of all mutability. Again, if the degradation of energy could be conceived as a *transmission of mutability* to some other unit in space, the view stated above cannot be proved to be erroneous. Our argument holds valid, because we regard degradation as a real absorption of energy by each unit, and require a source of new supplies of energy to maintain continuous mutability in the universe. But our argument concedes the transmission, and also postulates continuous mutability, and to this extent it is defective.

What Bergson thinks of an infinite universe.

We now turn to the latter part of Bergson's criticism,—an infinite universe will mean an absolute coincidence of matter with space, and the consequent impossibility of reciprocal action between its different parts. Once, however, we admit *reciprocity* of action, we have put reality in space, extended it, and must logically carry this extension to infinity. We shall shortly have to consider Bergson's theory of the relation of space, matter and mind. Here we must only note that matter cannot be conceived as occupying only a limited portion of space which latter extends infinitely beyond it,—for this will make space an objective, independent, infinite thing,—a meaningless combination of ideas; that matter has necessarily the form of space, and is, as such, indefinitely divisible into points like Bergson's so-called abstract space, and like the latter indefinitely extensible in thought; and that the activities of matter cannot be explained by any interpenetration of its parts, for once we have made parts which are necessarily inert and mutually exclusive, we cannot put them each into the other; nor can the explanation of these activities be sought in a reciprocity of forces, for forces that interact and are thus separated in space, can only be conceived as substantial in character,—and a substantial force is a meaningless term. Whatever occupies space has the very form of inertness, and we can give a dynamical character to it only by unconsciously putting into it more than what this form warrants; or, to put it more appropriately, what is objective or spatial can never be conceived as dynamical. In view of these reflections, the conclusion is quite justified that Bergson's criticism has not succeeded in disproving the theory of an infinite universe passing on mutability from unit to unit.

The theoretical conceivability of the hypothesis that stability and instability succeed each other.

Another solution proposed to his question is thus set forth by him: "Again it might be supposed that the general instability has arisen from a general state of stability; that the period in which we now are, and in which the utilizable energy is diminishing, has been preceded by a period in which the mutability was increasing, and that the alterations of increase and diminution succeed each other for ever. This hypothesis is theoretically conceivable, as has been demonstrated quite recently; but, according to the calculations of Boltzmann, the mathematical improbability of it passes all imagination and practically amounts to absolute impossibility." † Here the theoretical conceivability itself is questionable. Stability and instability in the physical world can never be absolute states, and they imply an apparatus of real elements that is inconceivable. There must be inert things and forces before any balancing operations can take place, giving rise to stability or instability. How these immaterial forces can come in *contact* with each other, or with the material elements, is unthinkable. Again, no theory can explain how a real stability can give place to instability; the moment we conceive such a transition, we must postulate a hidden current of instability all along. Lastly, a mere mathematical improbability cannot be a sufficient proof for the falsity of any theory, having a metaphysical significance. We are not here concerned with probabilities, but with meaning, *i. e.* theoretical conceivability, and this can only be conceded in the above case by one who fails to realize the import of the problem before us.

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† Creative Evolution, p 258.

Bergson's standpoint.

Bergson then enters upon an exposition of his own view with the words, "In reality, the problem remains insoluble as long as we keep on the ground of physics, for the physicist is obliged to attach energy to extended particles, and, even if he regards the particles only as reservoirs of energy, he remains in space; he would belie his rôle if he sought the origin of these energies in an extra spatial process. It is there, however, in our opinion, that it must be sought." † Nothing can be truer than this rejection of the physicist's standpoint; we cannot find energy in space; for space and whatever it implies (*e. g.* matter) can only be conceived as an indefinite expanse of inertness. It is strange, however, that such criticism of the physicist's standpoint should come from Bergson who, as we shall now proceed to see, merges space into non-space and *vice versa*, and thus ceases to make any real distinction between inertness and mobility. His treatment of the problem of space, matter and mind will supply us with a clue to the proposed solution of an extra-spatial origin of mutability.

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† p 258.

Relation of matter with space.

It is certain that Bergson makes a distinction between matter and space. If the two were coincident, matter will be without energy and absolutely inert, which, according to him, it is not. But evidently, he cannot keep them apart, for both partake of extension, though, in his opinion, one more completely than the other. Here the question is, can there be degrees of extension, or of 'externality of parts?' The question can be answered in the affirmative only by one who fails to realize the meaning of extension. We cannot conceive a *part* which is outside another and yet in it; it can only be in it, when it is identical with it, or to put tho logical implication of such a position more clearly,—when parthood or extension is abolished altogether. There is no *via media*, no degrees between extension and inextension (or what Bergson calls intension), between space and non-space. Bergson himself has emphasised again and again the qualitative difference of the two.

Bergson's erroneous idea about space.

But if his idea of matter is erroneous, no less is his idea of space. He conceives it as an absolute externality of parts. While, however, this absolute externality of parts must necessarily be conceived as discontinuous, space has meaning only as a continuous medium; in which case, parts of space can no more be held apart than parts of concrete matter. We shall see later on that *objective continuity* in any sense,—whether that of space or of matter, or even of the stream of thoughts,—is inconceivable and impossible. Here we must only note that space appears to us an empty expanse, because we have *abstracted* it from our experience of extended objects. If we take away matter with all its diversifications from the so-called space, the latter will fold up its seeming directions and cease to be space in any sense. *Space is an expanse only as an extension of the limits of extended objects*, and when these are removed to a higher category of mutual interpenetration, extension has ceased to have any meaning. Thus space is not an independent category, but a form of the existence of the things about us.

In what sense can matter have duration?

Bergson has tried again and again to put us on guard against confounding matter with space,—the former having some duration, the latter being completely without it. While speaking of duration, he says, the limit of thought-relaxation gives us a "glimpse of an existence made of a present which recommences unceasingly—devoid of real duration, nothing but the instantaneous which dies and is born again endlessly. Is the existence of matter of this nature? Not altogether, for analysis resolves it into elementary vibrations, the shortest of which are of very slight duration, almost vanishing, but not nothing. It may be presumed never-the-less, that physical existence inclines in this second direction, as psychical existence in the first."† Again, in another place, he says, "Thus, although matter stretches itself out in the direction of space, *it does not completely attain it;* whence we may conclude that it only carries very much further the movement that consciousness is able to stretch within us in its nascent state.......The more our attention is fixed on matter, the more the parts which we said were laid side by side enter into each other, each of them undergoing the action of the whole, which is consequently somehow present in it." † Here we must note firstly that any conceivable limit of thought-relaxation, can only be some form or object of thought occupying duration; when Bergson says, 'matter only carries very much further the movement that consciousness is able to stretch within us in its nascent state' he half appears to recognize this, although his expression is not quite happy. Anyhow the limit of a duration can only be duration, and not that 'instantaneous which dies and is born again endlessly'. Secondly, matter has duration only when it is conceived as certain 'forms of consciousness', and not as something resolvable into 'elementary vibrations' independent of us. Vibrations, even if conceivable excepting under grossly spatial images, cannot be unique and indivisible, unless they get the form of mobility from consciousness which *alone* gives *meaning* to movement in a continuous and gathering time. Durability is the quality of consciousness, and not of any movement or vibration conceived as objective. It is interesting to note his confusion when he says, 'The more our attention is fixed on matter, the more the parts...enter into each other,...' What has *attention* to do with the interpenetration of parts, and what is *the nature of the whole* that is somehow present in each of them? The question can never be answered if we regard matter as something existing by itself. The fact is that it is consciousness that has made matter durable, and so anything, and it is consciousness alone that is the whole present in each part. Lastly, we must note his hesitating attitude when to the query,—Is the existence of matter of this nature?—he replies, Not altogether; and surely to a great extent, for it represents one line or direction of energy, that which moves towards space against psychic movement. Here he clearly unifies matter and space under one category, the category of inertness.

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† Creative Evolution, p 211.

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† Creative Evolution, p 219.

Bergson obsessed by the crude notions of science.

Bergson's theory of the relation of matter and space is based upon the crude notions of physics which regards space as a distinct reality, and matter a reciprocity of interpenetrating forces. In one place, he says, "Perfect spatiality would consist in a perfect externality of parts in their relation to one another, that is to say, in a complete reciprocal independence. Now, there is no material point that does not act on every other material point. When we observe that a thing really *is* there where it *acts*, we shall be led to say (as Faraday was) that all the atoms interpenetrate and that each of them fills the world......What else can this mean but that matter *extends* itself in space without being absolutely *extended* therein, and that in regarding matter as decomposable into isolated systems, in attributing to it quite distinct elements which change in relation to each other without changing in themselves, in short, in conferring on matter the properties of pure space, we are transferring ourselves to the terminal point of the movement of which matter simply indicates the direction." The crudeness of philosophical conception is quite evident in this passage. 'A perfect externality of parts in their relation to one another' and 'a complete reciprocal independence' are meaningless expressions when significant of an objective reality. Parts that are perfectly external to each other, cannot be such, in their *relation* to one another, unless their ground of consciousness is recognized, which is far from being the case with Bergson; similarly, a complete reciprocity is irreconcilable with independence. Besides, these epithets can, with some justification, be applied to matter, which is a concrete substance; but when applied to pure space, which as such, can never lend itself to points and parts, (for these pre-suppose space), they lose every shred of meaning. He then proceeds to argue the interpenetration of material elements by their mutual influences. But the mystery of matter cannot be solved this way; it is impossible to establish unity by the mutuality of parts. We have already shown that parts that are extended can in no sense interpenetrate; and whatever can *occupy* a part must itself be a part,—spatial in form and inert in character. If each atom fills the world, where is the atom itself? And if 'matter extends itself in space without being absolutely extended therein,' *where is the limit dividing absolute extension from partial extension in our knowledge?* These questions never occurred to the author of the above passage with his scientific ways of thinking; and it will be something new for him to learn on analysis that 'systems' and 'atoms' which mark the terminal point of the so-called 'movement of extension', are *all* that we know of matter; that there are no degrees of extension; and that movement itself is only a 'conscious correlative' of these static points, and not an objective reality or a property of material particles, that we know by just opening our eyes to the supposed world of change. But this we shall consider later on.

Their relation to mind.

Having shown the relation of matter and space, Bergson proceeds to bring them together in one bond of unity with mind itself. He says that 'extension admits of degrees, that all sensation is extensive in a certain measure, and that the idea of unextended sensations, artificially localized in space, is a mere view of the mind, suggested by an unconscious metaphysic much more than by psychological observation.' † Again he says, "'This space it (the mind) already possessed as an implicit idea in its own eventual *detension*, that is to say, of its own possible *extension*. The mind finds space in things, but could have got it without them if it had imagination strong enough to push the inversion of its own natural movement to the end......The idea that it forms of *pure* space is only the *schema* of the limit at which the movement would end......Thus, the space of our geometry and the spatiality of things are mutually engendered by the reciprocal action and reaction of two terms which are essentially the same, but which move each in the direction inverse of the other. Neither is space so foreign to our nature as we imgine, nor is matter as completely extended in space as our senses and intellect represent it." ÷

Misconception about the nature of consciousness.

It is a poor idea of mind that can contain space in its own extension. If consciousness can extend or distend, how is it different from the objects it appears to know? Objects contract and expand, they look small and big; if consciousness does the same, it can only be a substance like them, and we have no right to distinguish it from the latter. To be true to our distinction, we must so conceive consciousness that it does not become a thing, an expanding or a contracting substance. What we call meaning or knowability is indivisible and unique, just because it is independent of every form or possible object. Forms are varied and indefinite in number, but their knowability remains the same,—we know a horse in the same sense in which we know a cat, a dog, a colour or a smell. Spaces may be large or small, but they do not require large or small consciousness to know them; the meaning of a mile is not greater than the meaning of a foot, nor the perception of a table greater than the perception of a book; if it were otherwise, the difference of greatness and smallness will itself become impossible, for this difference requires a unity which is indifferent to both of its members. But the perception of table does not lie side by side with that of the book, as one big inert block lies by the side of another small one; rather, that unity that makes them small or large, makes them any perceptions at all. This knowability has no size or quality; time has revealed progress in the forms of our knowledge, but none in knowability itself.

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† Creative Evolution, p 213.

÷ Creative Evolution, p 213.

Bergson says that the mind could have got the

Can the mind represent to itself its own extinction?

idea of space independently of things if only 'it had imagination strong enough to push the inversion of its own natural movement to the end'; but, being supplied with the necessary imagination, it will only become coincident with space, and exhaust its durability in an infinite spreading out, an endless externality of parts. Whence then comes the 'continuity' and 'unity' of the notion of space, and the exalted rôle of the mind to 'get' space from its own inversion? If this inversion is carried to the bitter end, there will be no consciousness whatsoever, no regaining of the lost duration in which alone space or any other notion can have any meaning; the mind will completely exhaust itself in an absolute externality of parts, in which less of imagination the better; it will be one with that metaphysical myth of an existence that 'dies and is born again simultaneously'. Consciousness, best to conform to the idea of space, must give up all idea of it altogether. The fact is that space is an idea having meaning in a durable conscious moment, and not that infinite expanse to which mind can only approximate by a complete and exhaustive inversion of its own natural movement. Can mind represent to itself its own extinction? Then indeed will there be some meaning in its spreading out to grasp space. But if,—and this is the more natural explanation,—space is an idea or a form of consciousness, the mind need not go out of itself towards its own extinction; it is the integrity and durability of consciousness that gives meaning to space, and not its disintegration and coincidence with the supposed limitless expanse; it is a complete misunderstanding of the nature of consciousness to think that it can 'represent' to itself the 'schema of the limit of its inverted movement from tension to extension.'

The confusion of qualitative sameness with qualitative difference.

The most interesting part of this theory is yet to be considered. What are the two terms by the reciprocal action and reaction of which the space of our geometry and the spatiality of things are mutually engendered? Are they intensive and extensive movements? But these are 'essentially the same',—they make one graduated scale whether of tension or of extension; according to Bergson, 'neither is space so foreign to our nature as we imagine, nor is matter as completely extended in space as our senses and the intellect represent it.' It is a revelry in meaningless words,—'an essentially the same' reality, breaking up into 'inverse movements' that mutually engender the space of geometry and the spatiality of things. A combination is here attempted of a 'qualitative difference' with 'qualitative sameness.' But how can one and the same reality break up into opposite movements? Or again, conceiving these movements as possible, how can they interact and engender things of such variety? These questions have been silently passed over.

Can Cosmology be a reversed psychology?

This same confusion of thought appears again and again in his writings. In one place he says, "Intellect and matter have progressively adapted themselves one to the other in order to attain at last a common form. This adaptation has, moreover, been brought about quite naturally, because it is the same inversion of the same movement which creates at once the intellectuality of mind and the materiality of things." † We may here ask, if matter and intellect are both the results of 'the same inversion of the same movement', how are they different and free to adapt themselves to each other? Is not this vague terminology only a subterfuge to unify matter and mind, the original movement and the inverted movement, in one stuff of reality? This unification is unequivocally suggested by him when he asks the question (page 219), "Should not the task of metaphysics be, to remount the incline that physics descends, to bring matter back to its origins, and to build up progressively cosmology which would be, so to speak, a reversed psychology? All that which seems *positive* to the physicist and to the geometrician would become, from this new point of view, an interruption or inversion of the true positivity which would have to be defined in psychological terms." If matter is to be resolved back into its origin, if this origin is psychological in character, wherein lies the apparent distinction between the so-called source and its result? Bergson not only admits this distinction, but the sense which he gives to it, makes its resolution impossible. The inversion or the interruption which has created matter is the inversion or the interruption of the original movement,—*which has thus lost itself in matter and does not continue in tact.* Where we see, therefore, the inversion, we cannot see the original movement; where we see the original movement, interruption cannot be possible. We cannot resolve the one into other, or have a cosmology which is a reversed psychology. We can resolve homogeneous things, but not opposite movements, or an interruption into a non-interruption.

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† Creative Evolution, p 217.

Vital Force, the source of all mutability.

We shall now be in a position to evaluate Bergson's idea of a non-spatial origin of mutability. He says. "Extension appears only as a tension which is interrupted."† And again, "We find that the direction, which this reality takes, suggests to us the idea of a thing *unmaking itself;* such, no doubt, is one of the essential characters of materiality. What conclusion are we to draw from all this, if not that the process by which this thing *makes itself* is directed in a contrary way to that of physical processes, and that it is therefore, by its very definition, immaterial." § Thus matter, or 'the concrete reality that fills this extension' represents an unmaking or a degradation of energy; but the contrary movement which is immaterial and non-spatial in character is a process of making. Bergson calls it, The Vital Force; and it is to this, that he traces the source of all mutability.

Its pretensions unmasked.

When, however, we begin to analyse the function of this vital force, we find that the rôle which it is conceived by Bergson to play in the life of the universe falsifies its supposed character. He says (p 259), "This impulsion, which has determined the development of the chlorophyllian function in the plant and of the sensori-motor system in the animal, brings life to more and more efficient acts by the fabrication and use of more and more powerful explosives. Now, what do these explosives represent if not a storing-up of the solar energy, the degradation of which energy is thus provisionally suspended on some of the points where it was being poured forth." One should have expected from this vital impulse, immaterial in its character, a self-contained and perpetual source of energy. But instead we find it engaged in a 'storing-up of the solar energy' which is only *provisionally* suspended from degradation. Which is the source of energy,—the sun or the vital impulse? Evidently, the latter can do nothing, if there were not a downward flow of solar energy towards degradation, represented by inorganic matter; it is helpless by itself; it can bring about no mutability; it can hardly be called energy. Bergson himself admits this when he says (p 121), "The effort of life cannot result in the creation of energy. All that it can do is to make the best of a pre-existing energy which it finds at its disposal. It secures such an accumulation of potential energy from matter, that it can get, at any moment, the amount of work it needs for its action, simply by pulling a trigger......The principal source of usable energy on the surface of our planet is the sun." Leaving aside here the questions, how the solar energy and the vital impulse interact, and how, after postulating this interaction, the vital impulse continues to be non- spatial, we may only ask,—In what sense is it the source of mutability when it only provisionally holds up the solar energy from degradation? It does not produce energy; it only secures it for free expenditure against its inexorable downward flow in matter. Is this freedom which signifies both power and immateriality, the true nature of the vital force? But this raises more difficulties than it solves; for freedom, as Bergson uses it, can only be understood in relation to forms which offer resistance and within which alone creative activity can be possible; and once it is so conceived, it has itself become formal, and ceased to be non-spatial in character; we cannot keep freedom freedom, while at the same time we connect it with material necessity. On the other hand, left to itself, detached from the material organism to which this vital impulse finds itself riveted, it becomes, according to Bergson, 'pure consciousness' or 'pure creative activity'. But freedom, thus understood, can never be creative; for, if creation has any meaning, it means the giving or changing of form,—which is impossible in the case of the pure vital impulse detached from matter; the freedom of this 'pure consciousness' or 'pure creative activity' will imply the minimum of mutability; it cannot be its source. Mutability or the power of changing form, necessitates a conception of energy as already loaded with material elements; but the intelligibility of such a conception is again questionable. We have thus seen that the vital force, the so-called non-spatial source of mutability, neither originates energy (for it finds it already in the universe), nor is it freedom in any real sense of the word; it is by Bergson's own admission, 'loaded with forms', and can thus only be conceived as a substance or a formal reality; its high pretensions are not at all justified.

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† Creative Evolution, p 258.

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The unification of matter and energy in the vital force.

Inconsistent though it is with his thesis that the vital impulse finds energy already on the surface of the universe, Bergson still makes an attempt to trace all energy to the vital impulse and then get matter out of it. He thus hopes to show the immaterial vital force as the only source of all the mutability on the surface of the earth. This he has already suggested while considering the relation of matter and space with mind. Here he sets forth the same position in clearer light, which only helps to reveal his idiosyncracies more glaringly. He resolves all reality into two movements,—the original movement representing the vital impulse, and the inverted movement the world of matter. He says (p 263), "Life is a movement, materiality is the inverse movement, and each of these two movements is simple, the matter which forms a world being an undivided flux, and undivided also the life that runs through it, cutting out in it living beings all along its track......There results between them a *modus vivendi*, which is organization." How are we to conceive this superb phenomenon of a *modus vivendi between two immaterial currents*? Movements are not things; how do they establish contact with each other, or enter into a *modus vivendi*? Even if it be argued that mechanical action, *i. e.* action by contact, does not throw any light upon the nature of energy, we have yet to ask ourselves whether this unintelligibility with which we are most familiar is less tolerable than the unintelligibility of an action between two immaterial realities. All action that we can *paint* to ourselves is by mechanical contact; and this very necessity of our thought should make us pause.

But Bergson does not stop here. Having resolved all reality into two opposite movements, he proceeds to derive the one from the other, however little may this conform to reason or intelligibility. No movement can become its opposite movement unless it first ceases to be the movement it originally was. Bergson therefore speaks of the opposite movement as an interruption, which he strangely derives from 'a process the inverse of materiality, creative of matter by its interruption alone',†— forgetting that an interruption of a movement cannot come from the movement itself, nor can it be a process, the supposed process of inversion. Even supposing that this inversion takes place somehow, we fail to see in the original and rising movement any meaning, differentiating it, in a real sense, from the meaning of the inverted movement; the course of material changes downwards is not 'stopped' but only 'retarded'; no transformation of the crude idea of energy contained in physical science is anywhere in view. Starting from there, Bergson was led to conceive degradation after the manner of Carnot; this degradation was only an equilibrium of energy, not its annihilation. But his metaphysics has betrayed him into a conception of degradation as pure space or complete destruction of energy. The *unmaking* movement which he strangely derives from the movement that is *making*, is made to signify both these conceptions indifferently, although the disparity between them is quite evident. Instead of solving the problem of physics, he has only succeeded in confounding it.

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† p. 259.

False and misleading images.

Bergson, however, is full of images in setting forth the original act of mutability or the creation of the universe. After giving the simile of 'a vessel full of steam at a high pressure', Bergson says, "So, from an immense reservoir of life, jets must be gushing out unceasingly, of which each, falling back, is a world. ...... But let us not carry too far this comparison. It gives us but a feeble and even deceptive image of reality, for the crack, the jet of steam, the forming of the drops, are determined necessarily, whereas the creation of a world is a free act, and the life within the material world participates in this liberty. Let us think rather of an action like that of raising the arm; then let us suppose that the arm, left to itself, falls back, and yet that there subsists in it, striving to raise up again, something of the will that animates it."† The first image he himself repudiates as not quite illustrative, for it implies necessity at every stage. But the second too does not carry us much farther; for, the striving will is already attached to the arm, and not able to create it as a free and original act of creation would suppose. But matter, according to Bergson, comes into existence only by a set-back to the vital force;

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† Creative Evolution, p. 261.

will this not necessarily affect the purity, freedom, even integrity of the latter? How then is the creation of matter a *free* act? And whence comes the set-back or the interruption? Does it come from within itself or outside itself? In the former case, it must always be there, part of its nature, and there is no meaning in creation or the originating of an inverse movement; in the latter case, which appears to be a more natural explanation, we postulate matter to begin with,—the genesis has not been accounted for.

In another place, the creative source or God is conceived as 'a continuity of shooting out', 'unceasing life, action and freedom'. But these images too are meaningless, unless forms are already there to make any activity possible. We can understand the chemical transformation of certain substances, such as explosives, under specific conditions. We cannot understand pure consciousness transforming itself into worlds in a 'continuity of shooting' without any outside conditions. Whatever is supposed as created is formal and limited to begin with,—how can it 'evolve' out of an uncreated, pure and free continuity of consciousness? Whence comes the limit, the form, the interruption? Bergson cannot explain. But his admission that 'the impetus of life cannot create absolutely, because it is confronted with matter' is significant. He continues, "It seizes upon this matter, which is necessity itself, and strives to introduce into it the largest possible amount of indeterminism and liberty." This admitted necessity of matter remains a mystery,—he cannot derive it from the original liberty.

Further absurdities about Bergson's conception of energy.

Bergson has failed to establish a non-spatial ground of mutability. We are presented with two inverse movements, necessarily set in space; we find matter retained to explain the creative activity of the vital impulse, and yet we find it reduced to a movement, nay carried farther back into the original current whose *inverse* it is. It is a tissue of fancy and not a fabric of serious thought. This becomes more evident when we consider the language he employs about his immaterial vital force. He says (p. 128), "Unlike albuminoids, carbohydrates and fats, being deposited in the cell rather than forming part of its substance, convey to it, in the form of chemical potential, an *expansive energy* that may be directly converted into either movement or heat." We know the carbo-hydrates, the fats and the cells,—but so far we are moving among the forms of matter. What do we know of the *energy* 'conveyed' by them, 'deposited' somewhere or 'converted'? These are words appropriate only for substances and things and not for an immaterial reality like energy. In another place he says (p. 267), "The process consists in using solar energy to fix the carbon of carbonic acid, and thereby to store this energy as we should store that of a water-carrier by employing him to fill an elevated reservoir: the water once brought up, can set in motion a mill or a turbine, as we will and when we will. Each atom of carbon fixed represents something like the elevation of the weight of water, or like the stretching of an elastic thread uniting the carbon to the oxygen in the carbonic acid. The elastic is relaxed, the weight falls back again, in short the energy held in reserve is restored, when, by a simple release, the carbon is permitted to rejoin its oxygen.........So that all life, animal and vegetable, seems in its essence like an effort to accumulate energy and then to let it flow into flexible channels, changeable in shape, at the end of which it will accomplish infinitely varied kinds of work."† Can energy be imprisoned in a wire or canal? Then it is a fluid, however subtle we may conceive it to be. Can it be stored in a reservoir? Then it is a quantum and occupies space. What idea have we of an immaterial reality? Can it be conceived as something outside, working through the universe as energy? Such outsidedness will reduce it to an object of our knowledge, and so invest it with a formal existence. Besides, energy conceived in this way must necessarily be correlative to matter and limited by it; it will become a thing. A new method and a new way of seeing truth is necessary; and then we shall find all our ideas about energy transformed. Bergson himself has admitted that the problem of energy is insoluble so long as we 'attach energy to extended particles or deposit them there as in a reservoir.' But he himself has not guarded against the error; he has followed the old method of the physical sciences, searched for energy in the biological world as we search for a thing or a substance, and in the end failed to bring about any transformation of the idea.

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† Also see p. 269.

The finitude of the vital impulse incompatible with its immaterial nature.

According to Bergson the vital force is limited in capacity. He says (p 267), "The vital, passing through matter, is finite, and it has been given once for all. It cannot overcome all obstacles. The movement it starts is sometimes turned aside, sometimes divided, always opposed; and the evolution of the organized world is the unrolling of this conflict." The spiritual is here degraded to a finite power, always opposed, sometimes divided. It appears Bergson has no conception of the meaning of finiteness, else he would not, consciously at least, apply it to his great God, the Vital Impulse. The idea of finiteness is inalienable from that of quantity or form, the chief characteristics of matter. It may, for the present, be granted that the vital impulse is continual process without form, immaterial. But since its effectiveness is limited, it must be a definite quantum; and its work or creation will be an index to its poverty, its helplessness. Again, if it can be opposed and divided, it must be formal in character. How can the spiritual or the non-spatial be divided or even opposed? There is no limit to philosophic idiosyncracies.

The same thought has been repeated by Bergson in many places. He says (pp. 133-34), "It must not be forgotten that the force which is evolving throughout the organized world is a limited force, which is always seeking to transcend itself and always remains inadequate to the work it would fain produce.........From the bottom to the top of the organized world we do indeed find one great effort; but most often this effort turns short, sometimes paralysed by contrary forces, sometimes diverted from what it should do by what it does, absorbed by the form it is engaged in taking, hypnotised by it as by a mirror. Even in its most perfect works, though it seems to have triumphed over external resistances and also over its own, it is at the mercy of the materiality which it has had to assume......Our freedom, in the very movements by which it is affirmed, creates the growing habits that will stifle it if it fails to renew itself by a constant effort: it is dogged by automatism. The most living thought becomes frigid in the formula that expresses it. The word turns against the idea. The letter kills the spirit. And our most ardent enthusiasm, as soon as it is externalized into action, is so naturally congealed into the cold calculation of interest or vanity, the one takes so easily the shape of the other, that we might confuse them together, doubt our own sincerity, deny goodness and love, if we did not know that the dead retain for a time the features of the living." Well might Bergson cry, "The spirit is willing, but the flesh is weak." But this is because the nature of the spirit is not properly grasped. Can spirit be turned from its course, deceived, hypnotised? Then it is a degenerate thing, not worth caring for. Who knows its reformation may yet alternate with its degradation?

But this is by the way. 'Paralysed by contrary forces', 'absorbed by the form' are images appropriate only for a quantum. To give any meaning to this limitation or finiteness of the original movement, Bergson had to postulate 'contrary forces', though inconsistently enough he derives these as we have seen in the ideal genesis of matter, from the vital force itself. He takes for granted that "the profound cause of this discordance lies in an irremediable difference of rhythm. Life in general is mobility itself; particular manifestations of life accept this mobility reluctantly, and constantly lag behind......" 'The irremediable difference of rhythm' is only a phrase to deceive intelligence and give a spiritual character to the conflict. Conflict however is of one type only,—that which exists between contrary forces. And wherever we have it, with the inevitable finiteness of the conflicting members, energy-hood is as meaningless as freedom; we shall be moving within forms and can never get to an immaterial reality.

Bergson's vital force is not only limited in power, but it is also limited in coherence. It cannot remain in tact during its evolution, and soon disintegrates into one-sided tendencies. He says (p. 149), "If the force immanent in life were an unlimited force, it might perhaps have developed instinct and intellect together, and to any extent, in the same organisms. But every thing seems to indicate that this force is limited, and that it soon exhausts itself in its very manifestation. It is hard for it to go in several directions at once: it must choose." Can an immaterial reality disintegrate into tendencies? Then it is no more than a hidden pocket of these with only a seeming and formal unity.

More glimpses about the Vital Force:
(a) Possibility of life and the point of inversion.

Bergson says (p. 270), "Life is possible wherever energy descends the incline indicated by Carnot's law and where a cause of inverse direction can retard the descent—that is to say, probably, in all the worlds suspended from all the stars. It is not even necessary that life should be concentrated and determined in organisms properly so called, that is, in definite bodies presenting to the flow of energy ready-made though elastic canals. It can be conceived (although hardly imagined) that energy might be saved up, and then expended on varying lines running across a matter not yet solidified. Every essential of life would still be there, since there would still be slow accumulation of energy and sudden release. There would hardly be more difference between this vitality, vague and formless, and the definite vitality we know, than there is, in our psychical life, between the state of dream and the state of waking. Such may have been the condition of life in our nebula before the condensation of matter was complete, if it be true that life springs forward at the very moment when, as the effect of an inverse movement, the nebular matter appears." Here some important considerations present themselves to us. (1) He says, 'Life is possible wherever energy descends the incline indicated by Carnot's law......*i. e.*, probably, in all the worlds suspended from all the stars'. If we examine the history of this descent, we shall have to go from the more solidified to the less solidified, from the planets to the stars, from the stars to the nebulæ and so on; we shall all the time be moving from matter to matter. Can we this way arrive at the point of inversion, where the spiritual or the immaterial first gets its set-back, allowing itself to degenerate into a downward movement,—or as Bergson puts it, 'at the very moment when, as the effect of an inverse movement, the nebular matter appears'? The very nature of the case renders this impossible. The moment we conceive such a point, the spiritual has already become material, for the supposed cause or origin of matter must be continuous with it; the 'mode of reality' of both will be the same, if there is any meaning in their causal connection.

(b) Can life be absent anywhere?

A very pertinent question comes up here,—Is there any system in this universe (regarded from the astronomical point of view) where energy is not descending, and life is not possible? Bergson says, 'Life is possible, ... probably, in all the worlds suspended from all the stars.' And again, 'Such may have been the condition of life in our nebula before the condensation of matter was complete......' He does not know his own mind,—whether to restrict life merely to the worlds suspended from all the stars, or to extend it to every phase of matter including the nebula. If all matter is the result of an inverse movement, and if life is possible wherever this inversion has taken place, there is no more any question of probability or possibility, but of certainty. But the hesitating language of Bergson betrays him; he says, 'If it be true that life springs forward at the very moment when, ...;' this leaves room for doubt, as though a degradation of energy is not *necessarily* accompanied by the upward movement of life.

Even if we could jump over the gulf between

(c) Where we should expect fullness of life, Bergson sees a vague vitality, a dream existence.

the material and the spiritual, and face energy or the original movement in its pure creative activity, we should not find an absence of life, but rather life in its fullness and completeness. His words, however, that 'life springs forward at the very moment when, etc.' clearly point to the fact that it is an after-effect of the inversion, and did not exist before it. We expected to find life in its purity and wholeness; we are presented instead with a vague and formless vitality. His whole treatment of the subject appears to show that life becomes more efficient, and more of a life, the greater the degradation of energy giving rise to solidified matter. He compares the life on earth and that in the nebula with the waking life and the dream-life respectively. All points to the conclusion that his vital force is a force, and life a life, only in relation to matter, solid matter that can offer resistance; in a nebular atmosphere, life has no direction or path; and perhaps, if we could go beyond it to the purely spiritual where resistance is impossible, we shall meet with no symptom of life, force, efficiency, or creative activity in any sense, but a state of perfect rest and pure nothing from Bergson's stand-point.

A more definite glimpse about the nature of his (*d*) What is vital force in and by itself?

vital force can be had from the following passage. He says (p. 272), "While, in its contact with matter, life is comparable to an impulsion or impetus, regarded in itself it is an immensity of potentiality, a mutual encroachment of thousands and thousands of tendencies which nevertheless are thousands and thousands only when once regarded as outside of each other, *i. e.* when spatialized." Here he admits that life, in and by itself, is not an impulsion or impetus; this it is, only when it is in contact with matter. But what then is it in itself? 'An immensity of potentiality, a mutual encroachment of thousands and thousands of tendencies.' We have already seen what to think of potentiality; energies or tendencies, *once postulated*, can never be conceived as going to sleep. Either then their actuality is an abrupt creation, and therefore unaccountable, in which case it involves a break in the continuity of the real; what has no past can have no meaning or explanation, and yet the past of a tendency or an energy can only be the self-same tendency or energy. Or they lie in tact in a hidden pocket, invisible only to our senses and the intellect; presumably, Bergson does not use the word 'potentiality' in this very relative sense. What then is his meaning? It can be no other than 'our ignorance how things happen as they do,' We never know forces, tendencies etc. in their potentiality; we know them only as they appear in our experience, *i.e.* as actualities. But since our thought revolts against conceiving anything as coming into existence quite suddenly like a new creation, it extends its history into the past and conceals its ignorance by postulating a previous state or cause that subdues the question without solving it. Force as we know it cannot come from not-force; and so it must come from potential force, forgetting that we have only one idea of force and not two. Tendencies cannot emerge out of nothing; therefore they must exist in a potential form before we know them. 'Potentiality' is a convenient word to explain all things and hide our ignorance; but it is meaningless.

That Bergson conceives his potentiality after the manner of the actuality is evident from the fact that he still sees 'thousands and thousands of tendencies' in it. But how can non-actual tendencies be in any way distinguishable? Indeed, he is conscious of the absurdity of such expressions, and tries to heal up the inconsistency by modifying terms, though these are equally meaningless;—he speaks of 'a mutual encroachment of tendencies.' Either there is no such encroachment and no mutuality, or the unity thus established is only of a chemical character. If the tendencies are real, they cannot be combined in a true and simple unity; if this unity is real, the tendencies must necessarily be false, non-existent. No metaphysical jugglery can escape this clear and definite issue; but sometimes the employment of non-significant language is a better way of meeting an uncomfortable question. If tendencies are 'thousands and thousands' only when 'once regarded as outside of each other, *i. e.* as spatialized', where is any meaning in a mutual encroachment? The fact is that Bergson goes from outside, and sees thousands first; but since he cannot unite them in a simple unity, he employs the round-about language of encroachments etc. We may here ask, what is the positive nature of this unity, beyond a mysterious amalgamation of these thousands and thousands of tendencies? We see only the latter, somehow hidden in the womb of some unknowable entity; we do not know their unity.

The identification of life with consciousness.

Bergson takes a still further step to specify the nature of the original movement. Life or vital force has no definite significance; different individuals may understand differently by it. But consciousness has a definite significance for every one; and so Bergson says (p. 275), "......it is consciousness, or rather supra-consciousness, that is at the origin of life. Consciousness, or supra-consciousness is the name for the rocket whose extinguished fragments fall back as matter; consciousness, again, is the name for that which subsists of the rocket itself, passing through the fragments and lighting them up into organisms. But this consciousness, which is a *need of creation*, is made manifest to itself only where creation is possible. It lies dormant where life is condemned to automatism; it wakens as soon as the possibility of a choice is restored." Here life and consciousness are confused together. 'Consciousness is at the origin of life.' We do not know whether these two names, life and consciousness, signify one reality, or they have distinguishable meaning. If consciousness is at the *origin* of life, there appears to be some distinction, and yet none that anyone can point out. The last line also suggests this ; when life is condemned to automatism, it still runs its course and continues to be life; but consciousness remains dormant, or what is the same thing, it remains unconscious; it is consciousness in no sense. This means that life and consciousness are dissociable. Yet when Bergson identifies consciousness with the rocket itself and that which subsists of it in the continuity of its shooting, he seems to allow no distinction whatsoever between this consciousness and the vital force. If this be true, and we think it is Bergson's meaning, we are more puzzled than enlightened. The ambiguity of the vital force enabled our imagination to picture it to ourselves as a 'simple movement' whose 'interruption' issued into the inverse movement called matter. But can we conceive consciousness as a movement? The coming and going of thoughts does not make a movement of consciousness; if it did, there will be no continuity in it. The fact is that consciousness always remains in its own place; the epithets 'past', 'present' and 'future' can only be applied to it, when consciousness is drawn out into a series, and the different members allowed to move in space like so many distinct units; but even then the continuity and the unity of consciousness is required to give meaning to motion. How can consciousness be conceived as moving when it is the unmoving ground of all motion itself!* Bergson himself emphasises the unity and the essentially non-spatial character of consciousness; it is meaningless then to speak of it as a movement. Movement is out and out a spatial conception,—it requires a thing with a definite form having definite bearings towards other things.†

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* See Chapter III. on Continuity.

† See reflections on Motion, Chapter IV.

But that which has no form and is out of space, no relations with aught else, *where* can it go and out of *what* place?

There are other difficulties too of Bergson's position. We can persuade ourselves that a force can receive a check or an interruption, when a movement comes to an end. But we cannot conceive consciousness interrupted. This has been worked out at length in a separate booklet, The Problem of Nothing. Bergson himself acquiesces in this position. An interruption of consciousness is still consciousness. We know the interruption; and this knowledge is only possible because consciousness goes beyond it; a real limit of consciousness can never be cognizable or appreciable as a limit. Let us try to recede from consciousness, and give it a slip. The task will be found impossible. 'In' and 'out' themselves get meaning from consciousness,—how can we go *out* of it? We can by no means interrupt consciousness, as we can by no means interrupt ourself; the very effort at this will become clearer and more tense consciousness. When, however, we consider that this interruption is another name for matter, Bergson's position becomes ridiculous. What is matter if not forms of consciousness? Bergson himself, in his matter and memory, is obliged to define matter as a 'bundle of images'. How can matter be an interruption of consciousness, when it is nothing but consciousness? But he is always trying to suit consciousness to special purposes,—sometimes emphasising its non-spatial character, and sometimes extending it in space to explain perception. We thus see the meaninglessness of Bergson's identification of consciousness with the vital force. No doubt the latter gains in definiteness by this, but the former loses in complete perversion.

Conclusion.

We could find no meaning in the forces of science. We expected to alight on some solid ground in Bergson's analysis of a non-spatial source of mutability or the vital force. All that we are told about it is that it is mobility itself, which receives its checks, and is diverted, paralysed or absorbed ; and that it is by its very nature, creative,—always working and transmuting forms. Such force can only be conceived as a substance, or at best a correlative of matter, without which it can create nothing, do nothing ; we have made but little advance over the crude idea of force contained in physical sciences. Our next problem will be the analysis of the idea of movement itself, for it is from this, that all our ideas of energy are ultimately derived.

CHAPTER III.

Problems of Motion.

Why we consider motion.

The foregoing pages have already anticipated a consideration of the problem of movement. We have said that motion is conceivable but not qualitative change; but even here there are difficulties in the way of a proper comprehension, and these must be solved before we can arrive at the true sense of energy. Again we have seen that movement is our sole experience on which the correlation of matter and force is based; to solve this correlation, we must understand what movement is. Lastly, Bergson has reduced the real to the mobile; but the sense which he attaches to this mobility does little more than confound the real. A thorough examination of the subject of movement in general is therefore necessary to get at the true meaning of power.

Meaning of Continuity.

All thinkers are agreed that motion cannot be conceived without continuity. Lotze says, "...it only happens in fairy tales that a thing disappears in one place and suddenly reappears in another, without having traversed a path leading in space from the one to the other: all observation of nature assumes as self-evident that the moving object remains in all successive moments an object of possible perception in some point of a straight or curved path, which unites its former and subsequent position without breach of continuity." † Applying this principle to facts of experience, Lotze concludes, "Therefore the transition from being to non-being of the same content is no continuous one, but instantaneous; still, no value *a* of a natural process or state arises thus in stantaneously out of absolute nothingness, but always out of a reality of its own kind, whose value *a* is the proximate increase or diminution of its own." ‡ All natural processes are thus conceived as continuous; the heterogeneity of states is reduced to the homogeneity of values of one and the same reality. This is in direct contradiction to our experience which shows differences of quality in the successive forms of natural processes. If we accept continuity strictly, the cause becomes coincident with the effect, all differences are abolished, and process becomes impossible; if we accept the process, and with it real differences of form, continuity becomes meaningless,—for, that which exists as a limit only, cannot become another limit continuously. Lotze himself is quite conscious of this conflict in thought; his reason, unconsciously led by the law of continuity, is obliged to regard the ground and its consequent as a real unity and the world without any basis for change; but his experience, sense-experience, shows diversity and succession of forms; these, discontinuous in themselves, set up the appearance of motion; † and it is in this appearance that Lotze finds the evidence of continuity. But such continuity has no meaning; we cannot follow each form through the entire process of its gradual melting away, or bring to clear consciousness the point of transition between it and the next succeeding form, as the law would require us. The following quotation is an interesting commentary on the way Lotze tries to prove the continuity of natural processes; he says, "Nothing could conceivably have the power to interpose an interval of time, vacant as in that case it would be, between cause and consequence ......; if *S* arose all at once, the cause of *its* reality too must have arisen all at once, and therefore, strictly speaking, have existed contemporaneously with *S* rather than arisen before it. Thus we find that it is impossible to regard the course of the world as a series of sudden discrete states conditioning each other without completely re-transforming it into a mere system of elements which all have their validity or existence simultaneously; quite unlike reality, the terms of which are successive because mutually exclusive.........Continuity of transition is not a formal predicate of still problematic validity, which we might assign to Becoming after some hesitation as true in fact; its validity is rather an indispensable presupposition without which the Reality of Becoming in general is inconceivable."† If reality is divided into *terms*, mutually exclusive and therefore successive, where is any sense in their continuity? An indispensable *presupposition* only, necessitated by the formalities of our thought, does not give us the meaning of the fact itself. Besides, we may legitimately ask, what do we know of Becoming which we want to explain by continuity? Is it not a case of *obscurum per obscurius?* The validity of continuity is not explained by the fact of Becoming; for, the latter is as mysterious to us, if not more, as the former. They are in truth one and the same problem, and if continuity is upon its test, no less is Becoming.

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† Lotze's Metaphysic, Vol. I, p 358.

‡ Lotze's Metaphysic, Vol. I, p 359.

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† Vide pp. 114-119 on the correlation of form and movement.

Can continuity be objective?

We agree with Lotze that no object can appear or disappear without traversing the intermediate space. But what *meaning* is there in such continuity? Objectively we only know successive positions, mere static points. But motion cannot be constructed by taking any number of these in space. Our ideal points will still have a gap between them; we shall thus get a series of discontinuous points but no motion. Bergson has thoroughly worked out this point in several places of his works. He has shown that the image of a completed line in space does not represent the process or the act itself.* The line is homogeneous, and therefore infinitely divisible; but the act is progressive, qualitatively specific and absolutely indivisible.† Mobility is not a thing, but a process, *real only for a conscious spectator*, who synthesizes the successive positions in a real unity 'resembling that of a phrase in a melody.' Thus motion and continuity is shown by him to be a *subjective* fact.

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† Lotze's Metaphysic, Vol: I, p. 361.

Objectively we can only take in what is static and limited; there is no place for continuity here. §

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* As a matter of fact the line itself is not made up of discrete points; we overlook the gaps between these, give to the point a sort of movement and construct the image of a line. But the act once completed, becomes static in space and so infinitely divisible.

† The step of Achilles is qualitatively different from that of the tortoise. The Eleatics reduced these qualitative differences to the homogeneity of the space traversed,—hence their paradox.

§ From this point of view a *continuous series* is a meaningless term; a series must necessarily be composed of members, and to say that a continuous series is that in which no member has a next to it is to ask the impossible. For, if we keep the continuity, the series disappears; if we keep the series, the continuity disappears. There is no middle course.

We cannot think or know continuity as we know this thing or that. All our images of it are static,—divisible into discrete and completed members. No doubt the intellect tries to supplement this discreteness by trying to fill the empty gaps with vague content; but by no straining of itself, can it approach real continuity or real motion; it always alights on the inert and the dead. If we want to approximate it to real continuity, we must take away limit after limit, member after member, till with the destruction of the series we have completed the cessation of thought.

The sense in which Bergson regards it as subjective.

Motion is not a thing, but a process; and process has meaning only in consciousness which gives it its continuity. But although Bergson admits this, he does not regard change and movement as merely subjective. There is real change and real motion in the world outside, and the extra-intellectual or the intuitive method of knowing which he advocates, is only to enable us to get into this. The shooting of a star is a real occurrence in space,—only, there are two standpoints from which to look at it. The line which it draws in space is static and apprehended as such by our senses; but the mobility which we catch in this drawing is the result of a process of synthesis of successive positions made possible by the continuity of our consciousness. The fact itself is independent of us; only we sometimes see it intellectually and sometimes intuitively. Bergson is still more definite as to the objectivity of motion or change, when he holds that there are many varieties of these. "Becoming is infinitely varied. That which goes from yellow to green is not like that which goes from green to blue: they are different *qualitative* movements. That which goes from flower to fruit is not like that which goes from larva to nymph and from nymph to perfect insect: they are different *evolutionary* movements. The action of eating or of drinking is not like the action of fighting: they are different *extensive* movements. And these three kinds of movement themselves—qualitative, evolutionary, extensive—differ profoundly. The trick of our perception, like that of our intelligence, like that of our language, consists in extracting from these profoundly different becomings the single representation of becoming *in general*, undefined becoming, a mere abstraction which by itself says nothing and of which, indeed, it is very rarely that we think. To this idea, always the same, and always obscure or unconscious, we then join, in each particular case, one or several clear images that represent *states* and which serve to distinguish all becomings from each other. It is this composition of a specified and definite state with change general and undefined that we substitute for the specific change. An infinite multiplicity of becomings variously coloured, so to speak, passes before our eyes: we manage so that we see only differences of colour, that is to say, differences of state, beneath which there is supposed to flow, hidden from our view, a becoming always and everywhere the same, invariably colourless." †

We admit that there is no hidden or colourless flow *beneath all changes of form;* but this is because a flow that is independent of us or outside us has no meaning,—it will assume some form and become static. But a change is real only as it is continuous. Its specificality can therefore only be upheld by confounding the intuitive with the sensuous way of looking at things. That which goes from yellow to green has the same sense in mobility as that which goes from green to blue; the difference is only of the static qualities fixed by our senses. Similarly about evolutionary and extensive movements. The forms of different processes and acts referable to the senses, are indeed distinguishable one from another. But mobility itself which has no form and no static associations in the way of dead and immobile limits, can only have one meaning,—that which is signified by the continuity of consciousness. If movements as movements are specifically different, we may ask, *wherein* does the process from green to yellow differ from that from green to blue? Have we any equivalent in knowledge of these differences? If not, they are meaningless and unreal.

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† Creative Evolution, p 320.

Bergson's fundamental mistake lies in believing that change can remain change independently of us, although he concedes that it is real only in and for consciousness. But the two positions are irreconcilable. Whatever appears as happening independently of us, must be limited by the form of the happening, (and for this we have the assurance of Bergson himself when he condemns becoming in general or undefined becoming as a mere abstraction that signifies nothing), and necessarily conceived as specific; but then the specificality is due to the form and not to the process or the mobility itself. If, however, change is a continuity free from all forms and qualities associated with the sensuous way of looking at things, and is real only in the nature of consciousness, it can have no varieties; we have no two ideas of continuity or mobility, as we have of red and green ; differences are possible only within forms, but never within that which is by its very nature beyond them. Bergson is confounding two absolutely different ways of knowledge, —those represented by the senses and the formless continuity of consciousness respectively. He sees change outside and distinguishes in it specifically different types, not knowing that he is rendering it thereby something formal, something dead and static, something that is indefinitely divisible into discontinuous points ; change, real change, has meaning only in that living and unbreakable continuity of consciousness, whose very inextension and absolute compactness of being leaves no room for change or movement.

The stand-point of common-sense.

Common-sense indeed believes that changes are real and independent of us. We sit in a train, a carriage or a merry-go-round, and we are conscious of motion that is not our own but a part of the world outside. Again, we lift our arm, and we internally feel the continuity of objective motion. These two sets of examples are really one,—the former can be reduced to the latter. We sit in a train etc., and what we actually feel is not the motion of the train etc., (for we are not quite so conscious of motion in a steamer even though the rate of its speed may equal that of a very fast conveyance on solid ground), but a certain organic sensation accompanied by a change in the field of vision. So far as the latter alone is concerned, there is no basis for any *direct experience of motion*, and nature only reduces itself to a non-efficient succession of forms, discrete in character. The efficiency as also the continuity implied in every movement, comes home to us by the introduction into it of our organic feeling. This organic feeling, therefore, appears to give us a sense of real objective movement. Bergson has given the illustration of the uplifting arm as our *experience* of the indivisibility and continuity of motion; and according to him, it is a non-intellectual experience, for the intellect can only grasp /static points, the different positions in space through which the arm successively passes. We shall, therefore, try to analyse it.

Analysis of the phenomenon of the uplifting arm.

Evidently, Bergson thinks that the organic feeling involved in the uplifting arm is continuous throughout. But this feeling is not really one; if it were, there will be no sense in regarding it either as continuous or as discontinuous. It is a succession of strain-feelings set on the unstrained thread of consciousness. These feelings which appear to give us a sense of objective motion, must necessarily be conceived as discontinuous; they are, however, made possible by the continuity of consciousness alone,—and in that continuity there is no sense of strain. It is a confusion between these two standpoints that makes us speak of the whole process as one organic feeling throughout. We cannot separate feelings as we do objects, because consciousness is one and continuous and we cannot determine where one feeling ends and another begins. But this is no reason why we should resort to unpsychological expressions, and speak of a *continuous organic feeling.* It is of the very nature of a feeling to be partial, fragmentary and flying,—in short to have an intellectual mould. A feeling continued for some duration will cease to be the specific feeling it originally was. We put our hand in hot water and retain it there for a sufficient length of time; and we soon find that the feeling has disappeared. Similarly, any effort sustained to a particular level will cease to give us *the sense of effort,* until fatigue sets in and brings about a relaxation of effort. Anyhow it is a change in the level of effort that gives us a sense of exertion; and once we admit this change as essential to the specificality of any feeling,* we have no longer one continuous feeling, but a succession of feelings. The fluctuation of attention entailed by a fluctuation in our effort will at once remind us that the so-called continuity is in fact a succession and a series, necessarily implying intellectual formalities. We thus find that whenever we represent our experience of motion by an organic feeling (and this appears to be the only way we can approach it), we make it discontinuous.

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*See introduction on the correlativity of change and inertness; also p. 119.

Our paradox, and how it can be solved.

We now come to a great paradox. Motion cannot be objective and so discontinuous; but if we take away its objectivity to save its continuity, we find that it ceases to be motion. We are most aware of movement when we jostle most and stumble most. With closed eyes, a bullock-cart gives us a greater sense of movement than a railway train; all earthly conveyances in their turn give us a greater sense of it than the movement of the earth itself through the heaven; and in fact, any movement, however headlong, through a frictionless medium, will give us no sense of movement at all,—it will be absolutely indistinguishable from perfect rest. Here is our paradox: motion can only be felt as motion, when it is discontinuous,—and then it is motion no longer; but pure and perfect motion, on the other hand, is identical with perfect rest,—it is devoid of any sense of movement or efficiency. Where is motion then? Those who ask this question, do not know what they ask; it is the same thing as to ask *where is where.* The only way to bring such inquirers to the folly of their question is to ask them to define the word and let us know what they exactly want; and they will be seen shuffling between continuity and discontinuity, between unmoving self-consciousness and static objective images. Our consciousness itself appears to us as moving,—and so it is represented in books of psychology by the image of a stream,—because we have created in it static points, specific thoughts and feelings, and made it discontinuous; having so made it, there is no *sense* in its movement; continuity once more presents us, this time in our mental life itself, the image of a series. But the moment we want to rehabilitate this sense, we must get behind these static points to that uninterrupted continuity of our consciousness, whose perfect serenity is the real meaning of all movement; till we get at this, movement is a mere word without any significance. Obsessed by the sense-intellectual view, however, we misinterpret continuity as discontinuous, perfect peace as restless activity; we need only analyse these notions to expose the illusion of words.

Whence then the idea of motion?

Here a natural but a meaningless question will possibly arise. If we never have any experience of motion as such in the world outside or our mental life, whence comes the idea itself which we naturally distinguish from other ideas. But this question implies a certain meaning of motion, and the questioner forgets that it is this very meaning that we are seeking to fix; if our inquiry shows that the word is meaningless as a distinctive, we must question no longer about it. Yet, perhaps, it will clear our thoughts, if we say a few words about its distinctive character. Motion is not the opposite of rest but its correlative. Specific thoughts and ideas cannot be what they are in and by themselves; the unconscious continuity of the Self which gives them succession, is the very ground of their being; isolated, they will perish altogether. It is interesting to note the error of Bergson in this connection. He says in Time and Free Will (p. 120), "......There is neither duration nor even succession in space, if we give to these words the meaning in which consciousness takes them: each of the so-called successive states of the external world exists alone; their multiplicity is real only for a consciousness that can first retain them and then set them side by side by externalizing them in relation to one another." Bergson thinks that each of the states of the external world exists alone, but that their succession and so their multiplicity are due to our setting them out in consciousness. But no state can be what it is unless it forms a link in a successive series and implies multiplicity, *i. e.* no state can be what it is excepting as a conscious state. The states of the external world which exist alone are meaningless myths. Red has the form of red in a system of colours, *i. e.* in conscious simultaneity coupled with succession, and not in and by itself as an independent state of the world. Similarly, all other so-called states of the external world, so far as they have any meaning and are real, cannot exist alone, but only as links in a conscious succession. It is the misunderstanding of this that makes Bergson distinguish sensations from their causes in the world outside, giving to the former succession and mutual permeation and to the latter simultaneity and mutual exclusion. This is not only incompatible with his thesis in Matter and Memory where sensation and its so-called cause are shown to be one and the same thing, but betrays a poor analysis of facts. He thinks it conceivable that space can be separated from time or what he calls duration, and states of the external world from those of the consciousness. This is an absurd distinction; for reality is meaning, and no state or form of the world outside can be shown to have any meaning unless it is conceived both in its spatial and temporal setting, *i. e.* unless it is reduced to a conscious state. But while Bergson errs in denying temporal setting to the states of the external world, he no less errs in denying spatial setting to conscious states. He speaks of the 'interpenetration' of these states and then proceeds to say, '...the idea of a multiplicity without relation to number or space, although clear for pure reflective thought, cannot be translated into the language of common sense.' † We fail to understand the chemistry of interpenetration. The different states and shades of consciousness must be accepted on their face-value, and no amount of reflective thought can dissolve the one into the other; interpenetration is a myth of psychology, which passes current owing to its vagueness only, fortified by respectable authority. Bergson himself is obliged to modify his distinction between a purely temporal setting and a purely spatial setting by his admission that 'we cannot even form the idea of discrete multiplicity without considering at the same time a qualitative multiplicity... ; without his interpenetration and this, so to speak, qualitative progress, no addition would be possible. Hence it is through the quality of quantity that we form the idea of quantity without quality." † As a matter of fact it is impossible to separate time and space, succession and simultaneity, in any aspect of reality that is supposed to have meaning.

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† Time and Free-Will, p 122.

The correlation of motion and rest.

We can now understand how motion and rest are correlative. The continuity of consciousness, in and by itself, is not motion, not a distinctive idea,—for the idea is of that which is static, a mere state of consciousness *already implying continuity.* But since the possibility of the states is necessarily dependent upon this continuity, the latter becomes a 'correlative term,' assumes the 'form' of motion, and becomes an 'object' of knowledge,—though, as such, it has already ceased to be continuity and so motion in any *real sense.* The motion which we *know*, is only an idea having the same basis in experience which is required for the reality of the different mental forms; nay, the two terms cannot be uderstood independently of each other. Motion is real only so long as diversity in mental life is real,—but so long also it is a word without meaning. Neither the continuity moves, nor the static forms which come on the stage suddenly and disappear as suddenly without traversing any space. On the other hand, continuity is not static,—it is not formal; nor is any thought or feeling really static; it is throughout in a process of change; the very moment we think we are in possession of the true nature of a thought, we have progressed beyond it, and the ascription of a definite character is ill-conceived. Our knowledge, however, avoids these contradictions; it makes a short cut and reduces all reality to correlative ideas,—false creations of the intellect[†] which are found on analysis to be without meaning and without truth. And yet when we have given up the correlation, it is not in pure 'nothing' that we plunge; but in that continuity of consciousness, the meaning of which cannot be grasped by the senses and the intellect; in it nothing comes and nothing goes; it reconciles motion and rest in absolute meaning.

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† Time and Free-Will, pp 122—123.

[†] Thought can only make distinctions between fixed conceptions, and within facts of the same category, the category of inertness. Motion must forego its own nature, if it stands related to inertness and is only to be understood as so related.

CHAPTER IV.

Problems of Motion (*Continued.*)

Absolute motion.

Those thinkers who accept real objective motion have naturally to face the problem of absolute motion. All motion that we are familiar with, is relative to static objects and points of reference; the fly appears moving only relatively to the carriage, the carriage relatively to the earth, the earth relatively to the Sun, the Sun relatively to other solar systems and so on. The motion that we know has always a direction and a rate of velocity, and these can only be determined in a relatively fixed system; we do not know pure and absolute motion without any determinations. We fix points, directions and distances before we can appreciate motion, and *about the fixity of these*, *we can never be sure; for*, *no object or point can*, *in and by itself*, *be conceived to be either moving or at rest.* But if this is so, there can neither be an absolute point of reference, nor the possibility of determining real absolute motion; every point of this vast expanse can be conceived to be at rest relatively to one system, and in motion relatively to another.

Lotze on its possibility.

Lotze thinks that our inability to recognize absolute motion cannot be interpreted as impossibility for the motion itself to occur, once real space is admitted. He says in his metaphysic (p 370), "If perfectly empty space is wholly devoid of related points for purposes of comparison, even of distinctions between the quarters of the heavens, still this does not plunge the motion itself into any such ambiguity or indefiniteness of nature as to prohibit it from actually occurring; only we lose all possibility of designating what occurs. However little we may be in a position to distinguish intelligibly between the point *z* which is in the direction of the moving object *e* and other points which are not, still it would be distinct from all others as long as we regard as real the extension of space which by its definite position towards all other points it helps to constitute." Again he says, "So the assertion that a motion is real is certainly not dependent for admissibility on the implication of a change of relations in which the real element in motion stands to others like it; other relations only enter as interfering and modifying causes....Absolute motion is an occurrence which is really contained in all motion that takes place, only latent under other accretions....If we understand by relative motion one which involves a real and assignable change of relative position on the part of the elements, how can this change have arisen unless one or several of the elements in order to approach or separate from each other had actually traversed the lengths of space which form the interval that distinguishes their new place from their old? But suppose we understand by relative motion one which was merely apparent, in which the real distances between pairs of elements underwent no change,—how could the appearance itself be produced?"

Such motion is already relative.

If we examine carefully Lotze's description of absolute motion, we find that it is already relative. 'The point *z* which is in the direction of the moving object *e*' is distinct from 'other points which are not', just because we have already started with space that is dissected into fixed and unmoving points, capable of giving us an easy reference of the object in question. The real issue is not whether actual objects in space are necessary to motion or only the fixed and imaginery points of the latter, but what is the *evidence* and therefore the *possibility* of the occurrence of any motion at all; and if we look into the evidence for the absolute motion of Lotze, we find that it is already relative to the discrete points of space which it traverses or which it does not. No doubt the absence of visible objects from space makes us unable to designate what occurs, but the moment we postulate real motion or motion in any sense, we have only substituted imaginery or possible designation for the actual one; the designation still remains there, and motion continues to be relative. Lotze has not succeeded in establishing absolute motion even on the postulate of real space; as a matter of fact, the moment he proceeds to do this, he has already transformed real space into phenomenal space, only substituting ideal points for visible things. He has not given us a new sense of motion, a motion that is intelligible in itself, and is more than a mere change of place; and yet without this *transformation in its sense*, its absoluteness is meaningless.

The sense in which we understand relativity of motion.

But what do we mean by its relativity? Not a *motion* that 'involves a real and assignable change of relative position.' This already concedes motion in the accepted sense of the term, and there is no meaning either in its relativity or its absoluteness; our capacity to grasp a real and assignable change of relative position is quite irrelevant, once the motion itself is postulated. Nor also a *motion* that 'was merely apparent, in which the real distances between pairs of elements underwent no change.' Such relativity too is meaningless; for, not only does it accept motion in the admitted change of appearances (the so-called apparent motion having nothing to distinguish it from real motion), but goes farther to suggest that there are relative positions and real distances between pairs of elements that do not undergo any change,—a most unwarranted hypothesis. These relativities as well as their refutation set forth by Lotze start with the ordinary and crude conception of motion, and so far there is really no difference between them; the absoluteness is as little proved as the relativity. What is wanted is the transformation of the idea itself. Motion is relative, not because it involves a real and assignable change of relative position, nor also because it is merely apparent, but because *there is no sense in the accepted use of the term;* it is only a conception *correlative* to an actual or imaginery difference of *position*, or to inertness in general, and as such, incapable of exact definition or assignable meaning in consciousness. The justification, however, of its occurrence in language and use in common life as a different conception, is found in the nature of that reality, which absorbs all the meaning we can *consistently* put in motion, but transforms it by freeing it from all the limitations of correlativity. We say motion is continuous. But so also is rest or inertness,† the opposite of motion. If then we want to give continuity to motion in any real sense, we must so understand it that the opposition between it and rest is abolished. Within real continuity the two cannot be distinguished. Again, motion implies a sense of energy or force; but that which is moved does the same, for it offers resistance; and we cannot understand how mere and pure continuity without resistance can be a movement. If motion were energy, in and by itself, it must remain a movement without anything being moved; but this is inconceivable. Once more the energy of motion is the correlative of the inertness implied in it, and if we are to get at the true sense of this energy, we must free it from the correlation, and *cease to think of motion as movement opposed to rest.*

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† The law of persistence of rest is based upon this fact.

Meaning of a change of place.

Ordinarily, however, we do not emphasise in consciousness either the continuity or the energy of motion. We see only relative change of place of objects. This change does not explain itself; it is therefore that we are led to a distinct conception, namely motion, which we regard as *implied* in that change. We see one situation of things and then another, but not the *movement* from the one to the other,—for, the movement is not an *object* of observation. What we actually see are different positions. The fact that *we* relate them, that *we* connect the past situation with the present in one meaning, shows, that this change is not referrable to the different situations themselves, or to any substantial force outside, but to *the act of correlation itself* which imposes its conscious continuity and unity upon its successive perceptions and gives meaning to change. Objectively, motion becomes inertness,—equivalent to the positions of space traversed; and continuity becomes a series, which is necessarily composed of discrete members.

Consciousness is the only truth of the correlation.

Consciousness, then, is the only truth or meaning of the correlation. Different positions become a multiplicity only for consciousness which holds them together; this is what we commonly mean by saying that the positions occupied are relative to motion. Again, motion is constructed by the unity and continuity of consciousness implied in the holding together of the traversed positions; this is what we mean by saying that motion is relative to the positions. If we do not break up reality into distinct sense-perceptions, we shall have no positions and things, and consequently no conception of the correlative motion; the same senses which constitute things and positions, also constitute motion by the continuity of consciousness implied therein.

Some might argue that a static manifold, though it is constituted by the senses like the successive views of a moving object, does not give us any sense of movement, and that it is vain therefore to reduce motion to a mere correlative conception of static views. There is something in the moving object over and above the views which we get of it in different positions, and that it is in that something that the meaning of motion must be sought. But this contention is based upon a defective analysis of facts. It is only when we get different perceptions successively of an object *assumed to be the same throughout*, that we resort to the motion of activity or movement to explain the change. But there is nothing beyond this *assumption* of the sameness of the object to distinguish a successive multiplicity, which gives us our meaning of motion, from a simultaneous multiplicity which we regard as necessarily inert and static in space. So long as we stand by the evidence of the senses, the 'form' of movement is the same as that of an inert manifold; we only get qualitatively different perceptions, implying the continuity of consciousness in either case. But when the analysis of this continuity exhibits its incompatibility with any static forms, † and we are obliged to get beyond the sense view, then alone is the correlation solved, and we get to the true meaning of motion; we find that Self-consciousness is the only truth, and within it there is no room for intellectual distinctions.

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† See Chapter III, problem of continuity.

Degrees of mobility.

Bound up with the problem of absolute motion is that of degrees of mobility. If absolute motion were real, there will be no possibility of determining either its rate or its direction, both of which require spatial bearings for the moving object. It is inconceivable that mobility as such can be more or less. We can have more or less of space traversed, or more or less of some quantum, but not of an immaterial fact like mobility. Ordinarily, we measure motion by the ratio of the space traversed to the time occupied. Evidently, space by itself is quite irrelevant to motion, being only a simultaneity of discrete points; we cannot judge of the latter by the length of the former,—the two are qualitatively different realities. Motion, as Bergson says, is real only for consciousness, *i. e.* only as duration; time then is the true determinant of mobility. Objectively considered, however, time is not on a plane different from that of space; it is a uniform medium, made up of time-units as space is made up of space-units. As long and short space cannot by itself determine either the possibility or the degree of mobility, so long and short time, understood as a uniform medium of homogeneous units, cannot determine them either; in fact there is no real difference between such space and time; and their union, a union of two inertnesses can give no better results. The usual way of determining the degree of mobility by the ratio of space units to time units is therefore quite meaningless.

On the hypothesis of time as conscious duration.

But Bergson gives us a new way of understanding time, though he is not quite explicit as to the relation of this time to space.† Time is not objective, a homogeneous medium made up of fixed units. It is *our* feeling of duration. If this is so, any objective measurement of mobility is out of question, for this feeling of duration is purely personal,—inalienable from the particular conscious individuality,—and cannot supply us with an absolute standard. Where there is energy and absorption of thought, time is short. On the other hand, weakness and vacantness of mind make time long and life prosaic. If then time is after all reduced to individual feeling, a minute and an hour are distinguished only conventionally; and when we measure mobility in their terms, we are introducing the same conventionality there. It is not the movement that is either fast or slow. We only know the states of our consciousness. We quantify these, give them an intensive character, and project them out in space, making degrees of mobility. If we could see that consciousness is never fast or slow,—it never comes too quickly with intense thought, nor leaves lingering with weak states, in short it always remains in its place and abides in its nature equally illumining all states,—the so-called feeling of duration can signify no more than a specific form of consciousness without any quantitative associations. We see *more* of consciousness in one state and *less* of it in another, because we formalize it, reduce it to a thing, and so make it amenable to the operations of the intellect, which first postulates units and then constructs quantities out of them. But once we realize the nature of consciousness, and find that it is not a thing, and that it cannot be cut up into units,—there can never be more or less of it. If then mobility has meaning only in consciousness, and consciousness is pure, unquantitative effulgence, there is no meaning in degrees of mobility, in fast and slow movement. We only see differences of spatial relation, but since *these can neither be measured in a simultaneity of time* i. e. *a uniform endless duration, nor in individual feelings of strain, nor lastly in the unquantitied and eternal self-effulgence of consciousness*, we must accept them as they are, mere appearances, and cease to read in them any measurement of mobility.

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† See the paradox of Achilles and the tortoise, p 134, Time and Free-Will.

Zeno's paradox in the light of this problem.

Lotze, conscious of the conventionalities of measurement, wisely therefore distinguishes motion from the measure of motion, though he was forced to this only by the necessity of distinguishing it from rest in each indivisible moment of its occurrence. He says, "Velocity and acceleration are not merely the first and second differential quotients of space and time; in that case they would only have a real value in as far as a length of space was actually traversed; but it is not only within an infinitely short distance, but in every indivisible moment that the moving body is distinguished from one not moving; although if the time is zero, that which distinguishes them has no opportunity to make itself cognizable, by the body describing a path in space and by the ratio of that interval to the time expended." † By this distinction Lotze hoped to solve Zeno's paradox. Zeno, as is well-known, broke up movement into space-points, with the result that movement became a mystery as also the differences of degree in it; how then could Achilles overtake the tortoise? The moment Achilles had approached or reached the point where the tortoise was, the latter had moved beyond it. So Achilles could never overtake the tortoise. Lotze solved this paradox by saying that movement was a real and specific quality distinguishing the thing moving (irrespective of our measurement) from one at rest. If then movement was a specific quality, different movements must necessarily be regarded as different qualities. He therefore continues, "If an element in motion that *passes through* a point, were even in the unextended moment of passing precisely like another which merely *is* in the point, its condition of rest would according to the law (of inertness) last for ever. Therefore, we shall not indeed conclude with Zeno that the flying arrow is always at rest, because it is at rest in *every* point of its course. But we shall maintain that it would have to remain at rest for ever if it were at rest in a single point, and that so it would never be able to reach the other places in which according to Zeno's sophism (which rather forgets itself at this point), the same state of rest is to be assigned to it. Now if that in which this essence of motion consists cannot exist in an indivisible moment as velocity, *i.e.* as a relation of space and time, but nevertheless must exist with full reality in such a moment, then of course nothing remains but to regard it as an inner state or impulse of the moving object which is in existence prior to its result." †

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† Lotze's metaphysic, p 385.

Bergson solves the problem in a similar way. He says that movement is not made up of discrete spatial points; but that it is continuous and must be explained by duration. Movement is a whole that has no parts; it is simple and ultimate; it is a drop, a real absolute occurrence, and not a mere conjunction of indefinite divisions of this drop. Every motion is really continuous, and qualitatively unique; and it is on this qualitative uniqueness that the paradox of Zeno is to be explained. He says in Time and Free-Will (p 113), "The mistake of the Eleatics arises from their identification of this series of acts, each of which is *of a definite kind* and *indivisible*, with the homogeneous space which underlies them. As this space can be divided and put together again according to any law whatever, they think they are justified in reconstructing Achilles' whole movement, not with Achilles' kind of step, but with the tortoise's kind: in place of Achilles pursuing the tortoise they really put two tortoises, regulated by each other, two tortoises which agree to make the same kind of steps or simultaneous acts, so as never to catch one another. Why does Achilles outstrip the tortoise? Because each of Achilles' steps and each of the tortoise's steps are indivisible acts in so far as they are movements, and are different magnitudes in so far as they are space." Again he says, "To measure the velocity of a movement,..., is simply to ascertain a simultaneity; to introduce this velocity into calculations is simply to use a convenient means of anticipating a simultaneity. Thus mathematics confines itself to its own province as long as it is occupied with determining the simultaneous positions of Achilles and the tortoise at a given moment, or when it admits *a priori* that the two moving bodies meet at a point — a meeting which is itself a simultaneity. But it goes beyond its province when it claims to reconstruct what takes place in the interval between two simultaneities; or rather it is inevitably led, even then, to consider simultaneities once more, fresh simultaneities, the indefinitely increasing number of which ought to be a warning that we cannot make movement out of immobilities, nor time out of space."

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† Lotze's metaphysic, Vol: I p 385.

The proposed qualitative interpretation of mobility cannot solve the paradox.

Bergson's explanation appears quite plausible, but it involves a fundamental contradiction. Durations that differ qualitatively are not taken in their becoming, but only as names for specific feelings; the different kinds of steps may differ as conscious states or feelings of exertion, but never as mere processes. The very conception of quality is static; and if duration has quality, it is borrowed from the forms of the understanding with which it is loaded; 'becoming' as such can have no specificality, no quality; we can never catch it at anything; nor distinguish moments or forms in it. Pure mobility, or pure continuity, free from all spatial associations, can have no quality. How is it then that Achilles overtakes the tortoise, that one mobility leaves another behind it, or as a matter of that, that there should be many mobilities in the universe? Bergson cannot explain. The very fact that he assigns greater mobility to Achilles betrays him. We only see the space traversed; we do not know the time taken by each, if we are to steer clear of objective, uniform and unenduring time, divided into units. Judging by real time, the tortoise's feeling of duration may be more intensive than that of Achilles, which is the same thing as to say that his mobility is greater. Qualitatively, therefore, the tortoise may be more mobile, and yet we say that he is less, for he traverses less space in the same time. But if there is no absolute time, no absolute duration, where is the *question* of more or less mobility; it is entirely an individual thing, and the space traversed is quite indifferent to it. On the qualitative interpretation therefore,—and we have already shown it to be fallacious,—we have not *explained* how Achilles overtakes and leaves behind the tortoise; we have only shown the problem itself to be meaningless; where the durations themselves are heterogeneous, who can say that the mere addition of spatial magnitudes can prove anything, much less give 'a greater length for the space traversed by Achilles than is obtained by adding together the space traversed by the tortoise'? As a matter of fact, Bergson unconsciously introduces homogeneity of quality into the steps taken by Achilles and the tortoise respectively, for he reduces them to *different steps of Achilles himself*, giving a uniform measure by the different degrees of strain in the same consciousness. It is only by reducing mobility to one universe instead of keeping it separate in the two worlds of Achilles and the tortoise respectively, that we are able to grasp the fact of the greater mobility of the former. But by such a subterfuge we have not explained the paradox of Zeno; we have left it where it was. The whole question of mobility requires a transformation into the unity and the continuity of consciousness, in which motion and rest are alike meaningless; and then there will be no *mobilities*, no degrees of movement and no problems and dilemmas to solve regarding it.

The beginning and amount of motion.

Those who find no fallacy in the doctrine of absolute motion in real space, have naturally to answer the question of the first beginning, amount and direction of motion in the universe. Lotze finds no difficulty here. He says in his Metaphysic (p. 374), "......, the impossibility of a first beginning will always recur. We should have to be satisfied with setting down the fact of motion with its direction and velocity along with the other original realities which we have to look on as simply given, and which we cannot deduce from a yet undecided choice between different possibilities......(But) the unavoidable relativity of all our designations of such constants is not to reduce us into the mistake of considering the constants themselves as indefinite. (The units are arbitrary, but the force measured has definite intensity.)...........Therefore, if we recognize that the first genesis of real things is altogether incapable of being brought before our minds by us, though we find their continuance intelligible, we may accept absolute motion in space and its direction as one of the immemorial data from which our further considerations must start." Here we may legitimately ask, why a question that is natural should always be found insoluble. 'Every permanent property of things, the degree of every force, and all physical constants whatever,' cannot evidently be accepted as sufficient explanations of themselves, and if 'we find their continuance intelligible,' it is only because we are unable, by the recurrence of the question, to get at their genesis. Should not this warn us that the question, and the postulate of the reality of things upon which it is based, are equally false? Let us examine this more carefully. Every thing, property or degree of force must have a beginning. But every beginning presupposes anterior time, when the thing, the property or the force were themselves altogether absent, non-existent. That, however, which comes to be only at a particular moment and gets a 'start' in reality, can have no connection with anterior time when it itself was not, and all questions about its beginning are irrelevant. Yet we cannot help carrying it beyond the present moment, and making it continuous with anterior and posterior time; for, we cannot conceive how a property can come *suddenly* into being, or having thus come, can it be what it is, excepting by its *setting* in time, *i. e.* its comparison with the properties that it is not in anterior and posterior time. We have, on the one hand, a timeless reality, without past or future, and living in its eternal present; it can have no form, and can give rise to no question; it is its own sufficient explanation. On the other hand, we have a time-reality, having an anterior and a posterior time, and necessarily formal in character; it cannot explain itself, and gives rise to questions that can never be resolved, for there can be no first or the last moment of time. Evidently, the forms of the world and all its properties partake of the latter reality. But then we fail to catch any meaning in them,—they refer us to other forms and other moments, and we return from our search with only worry added to ignorance; nay, we cannot understand how anything can have a prior and a posterior time, unless its meaning and so its reality were dependent upon that which existed before it and survived its particular history,—in short, timelessness were its real truth. It is the unbroken and the timeless consciousness alone in which the beginnings and the ends of things can have any meaning, and forms become possible. Thus the very transitoriness of things, whereby the world is what it is,—an endless wave of changing forms,—is an irrefutable testimony of Consciousness or the Self being its sole basis and reality. The velocity and direction of motion, like all other physical constants, become meaningless taken in an absolute sense. The question of their beginning is insoluble, because it is wrong in the very principle; it takes for granted the truth of things and motions, the very formal character of which makes a final solution impossible. *It proceeds by giving these forms a closed reality, while it is exactly with this postulate that it is inconsistent.* Once more we are warned against conceding an objective and independent existence to motion.

Lotze says, "The unavoidable relativity of all our designations of such constants is not to seduce us into the mistake of considering the constants themselves as indefinite. The units to which we refer the measurement of a certain force g, and in which we express it, are arbitrarily chosen; but after they are chosen it results from the peculiar and definite intensity of the force that according to this standard its measurement must be g and cannot be *ng*."† To put it shortly, this does not prove that every force *is* a definite and determinable intensity, but it is some intensity that cannot be otherwise than what it is. We first reduce force to some intensity, because we can only conceive of it in terms of the work turned out or the resistance overcome. But finding that this work and this resistance are themselves not absolute notions, but only conceptions relative to the intensity of the force itself (for, who can guarantee that the perpetual redistribution of the universe does not affect the absolute weight of everything and so proportionately the absolute intensity of the moving forces upon them?), we come to the simple and childish conclusion that every intensity must be what it is and no other. If our measurements are admittedly arbitrary,—arbitrary not only in the selection of the standard but in the very *principles* of measurement,—where is further evidence that every force has a definite intensity? We come to work, which again refers us back to force. There can be no solution this way. The absoluteness of motion, and the quantitative conception derived from it, are fundamentally wrong. Unless we break through the correlativity of motion and inertness, we shall be moving within interminable difficulties and never get at the truth.

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† p. 374.

Persistence of motion.

Connected with the absoluteness of motion is the idea of its persistence. Lotze is quite convinced of 'its validity in point of fact' which he says, 'is vouched for both by the results of experiment and by its place in the system of science. The better we succeed in excluding the resistances we are aware of as interfering with a motion that has been imparted, the longer and more uniformly it continues; we rightly conclude that it would continue unvaryingly for ever, if it were permanently left to itself without any counteraction. And on the other hand, however a motion that is going on may be modified at every moment by the influence of fresh conditions, still we know that our only way of arriving at the actual process of calculation is to estimate the velocity attained in every moment as continuing, in order to combine it with the effect of the next succeeding force'.* But having said so, Lotze at once becomes conscious of the theoretical difficulties of the law; he says, "Still, the more definitely we assume the ordinary ideas of motion, the more remarkable does the law of persistence appear; if motion is nothing but an alteration of external relations by which the inner being of the moving object is in no way affected, and which in no way proceeds from any impulse belonging to that object, why should such an alteration continue when the condition which compelled it has ceased?" † Lotze's dilemma can easily be traced to his belief in absolute motion. He admits that motion does not form a part or a state of the moving object. "It has been suggested," he says, "that the reason for the persistence of states of motion in things must in every case lie in the actual nature of the things; I am convinced that no explanation is to be found in this direction."* In another place, he expresses this idea even more definitely. "To say that motion is the natural state of things is utterly worthless as a philosophical idea; nothing is natural to a thing but to be what it is; states of it may be called matter of fact, but cannot be called natural."† If then motion is not a part of the thing, neither is it, according to Lotze, a mere change of relative position. What is it then? He admits that 'each particular thing cannot be in motion merely in general, but its motion must have a certain direction and velocity.'‡ Is not this, as we have already pointed out, an argument for the relativity of motion? But Lotze goes farther, and says, "In reality it was this causelessness that was the principal obstacle to the recognition of absolute motion; for what, strictly speaking, does happen if the advancing element *e* traverses one empty space-point after another, without being in itself at all different when it reaches the third from what it was when in the first or second? or, fruitless as the transition is, without so much as receiving an indication of the fact of its fruitless occurrence: finally, without making it possible for even an observer from without, were it only by help of relations to other objects, so much as to give a bare designation of the supposed proceeding? And are we to suppose that a process so unreal as this, a becoming which brings nothing to pass, must of necessity last for ever when once stimulated to action, though to begin with incapable of originating without external stimulus?"† Before we discuss Lotze's solution of the problem on the view of phenomenal space, we must note that it is not only the causelessness of absolute motion but also its meaninglessness that is the chief objection to it. What is it that persists? We know that the thing persists, and also the different positions of space through which it passes; and these alone are given to us objectively. Motion, conceived as something over and above these in the objective world, an absolute occurrence in space, has no meaning, no form within our experience. That alone can be a valid fact and a truth, which is perfectly intelligible in itself without the aid of admittedly irrelevant ideas. But motion, as pure becoming freed from the static elements above stated, does not connote anything, anything that can be conceived to have persistence or not. What is then meant by the persistence of motion? This law is based upon the absoluteness, independence and reality of motion in the objective world, but on that very postulate is it meaningless, insoluble.

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* P 366. † p. 366.

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* p. 367. † p. 376. ‡ p. 376.

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† p. 376.

This is not a separate problem: it is only the problem of the occurrence and the reality of motion repeated in another form.

Lotze's theoretical difficulties can now be easily understood. On the one hand, motion does not form a part of the thing moving; on the other, there is difficulty in conceiving that 'motion which has been generated in a thing not by its own nature, but only by means of external conditions, is to count among the states which are conceivable as going on to infinity without contradicting that nature and those relations."† The difficulty does not lie in the fact, how motion produced by external conditions can continue on to infinity without contradicting 'that nature and those relations;' for the very manner of its production has condemned it to a relative conception, an assignable change of position in space; the external conditions that have moved the object without affecting its nature, have only succeeded in changing its position in space, and

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† p. 367.

this change can be easily conceived to go on to infinity, if its generation required no more than a momentary and non-persistent impulse that was indifferent to any continuation of motion at all. The real difficulty is not how motion, once generated by external conditions, can continue on to infinity, but *whether* and *how* it took place at all. If we can understand this, persistence in the sense of Lotze, will not present us with a separate problem. An impulse that can produce any change at all without continuing as a cause *throughout* that change, cannot contradict the continuation of this change to infinity. The real meaning of Lotze's difficulties is not the persistence or the continuation of motion, but *the very possibility of its occurrence.* He himself realizes this direction of his difficulty, when he says, "Instead of a direct demonstration of the law, I believe that nothing more is possible than an indirect treatment," and then proceeds to show that the very possibility of motion occurring at all is dependent upon the truth of this law. He says, "If we do not regard this law as valid, then not even the smallest portion of the short journey in question will really be achieved; the moment that C_1 so much as threatens to change the place of *e*, and so transform itself into C_2, the determining force with which it purposed to produce this result must disappear at once, and the matter will never get as far as the entrance into action of the fresh condition C_2 which could maintain the motion; for the motion never begins."† Such an indirect treatment does not solve our problem, but only substitutes another for it, or better still, it helps to elucidate the real meaning of our difficulty. To prove persistence, we fall back upon the occurrence of motion. But is the occurrence more intelligible than the persistence? Lotze thinks it is; and so he says, "......... ; of course it cannot tell us how, strictly speaking, it comes to pass that motion when once generated maintains itself; but still we can see that the law of Persistence is not a marvellous novelty of which it might be questioned whether it would or would not be true of a given natural motion; in fact its truth is an integral part of our idea of motion. Either there is no such thing as motion, or, if and as there is, it necessarily obeys the law of Persistence, and could not come to pass at all if really and strictly the effect produced had to end with the cause that produced it......... ; the excitation would begin to be inactive at the moment in which it began to act."† But if Persistence is an integral part of the occurrence, and if the latter is to us self-evident and unquestionable, where is any mystery about 'motion, once generated, maintaining itself'? Generation is itself the maintenance; we cannot conceive a motion *occurring* that does not traverse any space, does not maintain itself. If we know generation, we have known in that, its integral significance, namely Persistence. Why should we accept the former as real and intelligible, but stumble againt the latter, seeking roundabout ways of substantiating it? The fact is that we do not know our mind, the true meaning of our question. It is not Persistence that requires to be solved, but the nature and the possibility of motion itself. Lotze accepts the latter as an undoubted truth of our experience; but the very fact that he loses his way on an integral part of its significance, should warn us against taking that experience too easily, or resting confident with its supposed intelligibility.

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† p. 369.

Persistence is intelligible in the nature of the consciousness alone.

The problem of Persistence formulated on the basis of an objective absolute motion is meaningless. Motion is not a substance or a stuff. Nor can any stuff be conceived as persisting, excepting as conscious continuity. A thing by itself can have no past, present or future; it is in itself that mythological 'instantaneous' of Bergson 'which dies and is born again endlessly'. And if all ideas of succession are irrelevant to it, so is the idea of

Persistence. It is consciousness alone which by giving meaning to succession, demonstrates its own persistence, and by creating time proves its own timelessness. But motion, as an absolute objective occurrence, that neither conforms to our idea of a thing nor to that of consciousness, is a meaningless word. It may be convenient for science to use it for designating the 'conscious correlative' of changed situations, but then to speak of its persistence is as meaningless as to speak of it as a real, independent occurrence in the world outside. If we realize that motion has meaning only in pure succession (if that expression has any meaning) or conscious continuity, we shall cease to speak of combination of results, summation of values, and so of varying rates of change or motion. † This line of thinking can never prove Persistence, for it is fundamentally wrong.

Significance of the law as formulated by science.

Accepting the scientist's stand-point, however, we still find that there is no ground for Persistence understood as maintenance of motion after generation. Every motion is a transition from inequilibrium to equilibrium, and so necessarily short-lived and graduated by external conditions. This gradation has induced Lotze and other scientifically-minded thinkers to break up motion into successive units of varying (but in themselves uniform) velocity. They think that every motion has a *definite* impulse to start with, *i. e.* it is uniform to begin with, and that it is the addition of other impulses to this persisting substratum, that gives us a series of successive and higher rates of motion. But once we break up the continuity of motion into units of uniform velocity, we have made it meaningless; for, the very essence of motion consists in the continuity of *change of its rate of movement*, or a *gradual* transition from a state of inequilibrium to one of comparative rest. We cannot conceive a *unit of motion, something that ends as it begins*, without undergoing any change during the interval. It begins from rest and if it has *continuously* to end in rest, it will never begin at all. If any part of a change or a motion is uniform, the whole will be a set of uniformities, without continuity and without succession, and so best described as 'the instantaneous that dies and is born again endlessly.' The essence of motion lies in a continual change of its so-called rate in organic oneness; it is *not-uniform* to begin with, and is a different rate of change in every moment of its duration that we may select for experimenting; nay, the very *rate* of change is irrelevant to it; for it is a real growth in every undivided moment of its duration, and cannot be amenable to mathematical calculation or measurement which presupposes uniformity and inertness. Thus the scientific law of Persistence based upon uniformities and addition of stimuli is defective in its very first principles. To speak in the phraseology of science, the latter must regard every motion as an indivisible transition which cannot persist, for by its very nature it is only a *transition*, a link, between two states of rest; there is persistence neither in the part nor in the whole of this transition, understood as an objective fact.

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† The contention that these are objective because they regulate conscious duration cannot hold ground; for, there is no meaning in an objective and independent rate of change that is *only* intelligible as subjective feeling of duration.

Lotze's idea of motion on the view of phenomenal space.

So far we have concerned ourselves with motion as it is understood in mechanics, which postulates unchanging objects and an empty and absolute space. We have seen that Lotze thinks such motion as possible. But holding a different view of space, and realizing the force of those who object to absolute and mechanical motion on the ground of its causelessness and meaninglessness, he proceeds to give his own idea of motion with the words, "These inconceivabilities have at all times led to some rebellion against the view adopted by mechanics (though it yields so clear a mental picture and is so indispensable in practice), which makes the moving element merely the substratum of the motion, without any peculiar nature which is affected by the motion or generates it by being affected. It is objected that motion cannot consist in the mere change of external relations, but must in every moment be a true inner state of the moving body in which it is other than it would be in a moment of rest or of different movement. Then can the view which concedes to space no more than a phenomenal validity offer anything satisfactory by way of a resolution of this doubt?"*

A qualitative mark necessary for any arrangement of phenomena in space and the possibility of the appearance of motion.

Lotze conceives every motion to be a specific state of the moving body, distinguishing it qualitatively from one at rest or of different movement. While every real motion is thus a specific quality, its appearance can only be accounted for by the effect of this inner state or quality of the moving body upon a percipient subject. But such effect can only consist in producing a corresponding state in the latter. It will not however be a semblance of motion yet. On p. 378, Lotze says, "Whatever the inner state p within e may be, and in whatever way it may alter into q and its effect π on E into k, still, for an E

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* p. 376.

that is simple and undifferentiated in itself all this could only be the ground for a perception of successive contents, not for their localization in space and for their apparent motion. More is required than even a plurality of elements, *ep*, *eq*, *er*, in different states of excitation, operating simultaneously on a simple *E*." Here *E* stands for the subject. Such a subject, represented as an immediate consciousness, can only know different states or forms of *e*; but these cannot yet signify to it, according to Lotze, any motion, unless they are unmistakably articulated in space, which cannot be possible for an immediate consciousness as some seem to think by a popular interpretation of the Kantion view. In the words of Lotze, "To make one arrangement of phenomena *a b c* distinguishable from another arrangement *c b a* or a downward motion to the right from its counterpart in an upward motion to the left, it is essential that the directions in question should be unmistakably distinguished in the space-image for *E* itself by a qualitative mark; then *E* will be able to refer every action or modification of an element to that direction to which it belongs according to the qualitative nature of the impression made or of the modification of that impression."†

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† p. 379.

This mark only possible for a consciousness united to an organism.

The qualitative mark that is to enable us to localize every impression and the modification of that impression is denied to the immediate consciousness, for, being without an organism, it can have no up and down, no right and left, no directions of space. Such expressions "would not become intelligible to it till it had ceased to be an isolated atom endowed with knowledge, and had come into permanent union with a plurality of other elements, we may say at once, with an Organism; such that its systematic fabric, though still to be conceived as itself unspatial, should supply polar contrasts between the qualitatively definite impressions conducted from its different limbs to the conscious centre."† Again he says, "Space only exists within such subjects, as a mental image for them; and is so articulated for them by the qualitative difference of their impressions, that they are able to assign the appearances of other elements their definite places in it."*

The semblance of motion is the only motion we know; but it has no meaning unless the correlation is resolved back into self-consciousness.

On view of absolute space without directions, Lotze argued that motion was conceivable, but its designation impossible; on the view of phenomenal space, as laid down by him, 'the condition of a possible designation and definition of the apparent motion' becomes 'at the same time the condition of its occurrence as apparent.' The percipient subject supplied with an organism, has now a well-articulated space, with definite directions, which are essential not only to the defining of a motion but also to its apprehension as a motion at all. It is instructive here to note that every motion requires a comparatively steady back-ground, and that this is a creation of the binocular vision of man, which determines the distances of things by their relative displacement.† A percipient subject with an organism having different points of sensibility is necessary to give any meaning to change of spatial relations, without which no motion can be apprehended. If we take away any such subject, and abolish all differences of points of view in an immediate consciousness, there will be no possibility of a semblance of motion, which semblance is all that motion signifies to us. Lotze however appears to make a distinction between real and apparent motion, and seems to think that the phenomenal space can only explain the possibility of designating motion, and the occurrence of the latter as *apparent.* But if we take away the phenomenal space, and with it all distances of things and relations of points, there will be no meaning in or possibility of any displacement, and no motion, real or apparent. Motion is bound up with the idea of phenomenal space; it is a change of spatial relations, which relations only exist in a percipient subject endowed with an organism. But it must be noted here that we do not see the change; we only get qualitatively different impressions of the same object at the same time owing to differences of our sensibility; we cannot get beyond these; and yet, taking the support of the unity and the continuity of our consciousness, these impressions appear as motion. If we analyse the latter conception, we can never get beyond this mere appearance; there is no more meaning in it than there is in the appearance of a blue colour. We cannot explain why blue appears as it does, nor, what meaning is there in it beyond the mere *appearance* of its bluishness. It is a fact which we have to accept as it comes, without the possibility of any further explanation or elucidation. Motion is such an ultimate appearance. If we further analyse it, we shall get, (1) qualitatively different but definite views, and (2) the continuity of consciousness on which the multiplicity and so the very individuality of those views is dependent. We shall thus get only one truth, the truth of the continuity of self-consciousness, on which is based the correlation of those views and motion. Even the fact that the moving object is the same has no metaphysical value; for it is unbacked by experience which only gives different views. Besides, what right have we to accept the image of an object at two feet distance as a truer representation of it than one at 20 yards distance. We believe the object to be the same throughout its supposed movement, for this belief serves our practical purposes and is more conformable to our intellect, which having started with the idea of definite and rigid things, cannot conceive a qualitative break in them; such unity of the object can only serve for an intellectual construction of motion (for, nothing can move if nothing can leave its place without undergoing a qualitative change, *i. e.* becoming other than what it is;) but cannot bear a deeper diagnosis which goes at the very root of the reality of motion itself. The sameness of the thing therefore is only our convenient belief; the moment we begin to doubt it, there is no way of establishing it by an appeal to experience, for the very standpoints (of varied time or place or of both) of looking at it are different; if these can never be one, the object can never be *proved* to be the same. All that can be argued in favour of it will be, the intellectual impossibility of conceiving motion in any other sense. But such an abstract intellectual construction of motion which proceeds by doubtful hypotheses, is not worth anything.

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† p. 379. * p. 380.

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† See Mach's Chapter on Binocular vision, Popular Scientific Lectures.

Solitary motion impossible: Lotze unconsciously introduces the rejected co-ordinates.

We have seen that Lotze criticised the view which required co-ordinates independent of the observer to give any meaning to motion. He said that such motion, absolute in character, was possible, though we could neither designate nor define it. But on the view of phenomenal space, which does not require an immediate consciousness, but one endowed with an organism, he argues that solitary motion is not only possible but also capable of designation. He forgets, however, that the observer united to an organism, and having a definite relation with the things outside, is not perceiving 'motion of a solitary object.' There can be no solitary object; every object gets its form by contrast. And the perceiving subject, the moment it is conscious of any object or point outside, creates at once a whole system of related points, or what Lotze calls phenomenal space. Thus the possibility of the designation as well as that of the occurrence of apparent motion is after all dependent upon 'co-ordinates independent of the observer' in the same sense in which the solitary object, supposed moving, is independent of him. The solitary object which, according to Lotze, gives rise to the perception of motion by producing different qualitative impressions in the perceiving subject, does so only by taking the unconscious support of the observer's own body as a co-ordinate. This co-ordinate is in no way different from the co-ordinates demanded by the common view. Besides, the moving object, in order to be perceived as such, must necessarily require an unmoving back-ground, *i. e.* the whole system of related points or what we call phenomenal space. When we have granted all this, there is no meaning in keeping the object or its motion 'solitary' in any sense.

Can a *thing* be conceived as having an unspatial history of inner states?

We now come to the real issue involved in Lotze's view of this problem,—the change of the inner states of a thing corresponding to its motion. It is interesting here to note his own profession of ignorance on this point. He says, (p. 382) "Still I feel that these doctrines are inadequate, as strongly as I am persuaded that they are correct; they leave in obscurity a particular point on which I will not pretend to see more clearly than others. It concerns that transition of *e* from one inner state to another which in acting on us produces for us the semblance of a motion of *e*. ......It can be nothing but an inner unspatial occurrence which has a capacity of appearing at some later time as motion in space by means of that action upon us which it is for the moment without. Here we are obstructed by an inconvenience of our doctrine which I regret, but cannot remove; we have no life-like idea of inner states of things......; and anyone who absolutely scorns to conceive them as even analogous to the mental states which we experience in ourselves, has no possible image or illustration of the constitution by help of which they accomplish this fulfilment of essential requirements." Lotze recognizes that we cannot conceive the transition of one inner state of a thing into another. This is because such transition would make a thing other than what it is, and not because of any accidental or remediable inability on our part to conceive it; the very nature of the case excludes its possibility. But Lotze thinks that before this transition acts upon us, 'it can be nothing but an inner unspatial occurrence having the capacity of appearing as motion in space by its action upon us.' This is to say that transition is by its nature something real outside us, and yet unspatial,—which is absurd. There can be no unspatial *transition.* Where there is no space, there can be no states, and nothing to change into anything; but where we have space, we get states which are necessarily immobile and fixed; in either case transition is meaningless. The analogy of the mental stream is quite misleading; so long as we see states, we see them spread out side by side in ideal space. We can never understand or explain how one form melts into another, for there is no such melting. We see a tree and then a stone. Can any one show how the form of the tree melts into that of the stone, though we are not able to define the limit of the two perceptions in consciousness? This becomes even more palpable when the perceptions succeeding each other are heterogeneous in character and belong to two different senses altogether,—a most cogent proof that there are no gradations between states of consciousness; where we see states, we only see immobilities; but where we *seem to perceive transition*, there are neither states nor motion,—but a reality that is beyond them both. We see states following each other, or changing imperceptibly, because of that unity and the continuity of consciousness which can never be conceived as a correlative term. But a *thing* which must necessarily be static or at best a series of succeeding states without any basis of permanence in itself, can never lend itself to any idea of continuity to which all transition or motion must conform. Lotze's idea therefore of tracing the semblance of motion to the qualitative but unspatial change in things is fundamentally wrong.

A *state* cannot explain persistence or inertia of motion.

This position of Lotze further emphasises the difficulties of the law of Persistence, which has already been accepted by him as an undoubted fact. A state, necessarily fixed and determined, can only condition a definite position of an object in space; it cannot explain the continuity of motion. But even if it is conceived as itself undergoing change, it can at best condition a different motion corresponding to this changed state, and not explain the persistence of the one already in existence, by which persistence alone every new increase or decrease of motion can be understood. Lotze is quite conscious of this difficulty, which he sets forth in the following words: "Now what inner constitution can we conceive *e* to possess, capable of producing in our eyes the phenomenon of this inertia of motion? Considered as a quiescent state it could never condition anything but a permanent station of *e* in our space; considered as a process it still ought not to change *ep* into *eq* in such a way that the new momentary state *q* should remove the reason for the continuance of the same process which took place during *ep*; we should have to suppose an event that never ceases occurring, like a river that flows on ever the same without stopping, or an unresting endeavour, a process which the result that it generates neither hinders nor prohibits from continuing to produce it afresh." † Unable to explain this phenomenon, he resorts to false analogies. He says (p. 384), "It is certainly my belief, though I will not attempt a more definite proof, that mental life would present instances of such a self-perpetuating process, which would correspond in their own way to the idea, extra-ordinary as it is though not foreign to mechanics, of a *state* of motion." In no sense can the mental life represent continuity of motion as understood by Lotze. Phenomenally considered, it is never a uniform stream, anything corresponding to Lotze's inertia or state of motion. There is however a real sense of its continuity as pointed out in Chapter III,—but then it ceases to be either a motion or a state. Till that sense is grasped, all problems of motion are bound to remain as they are, unsolved.

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† p. 383.

CHAPTER V.

Meaning of Efficiency.

Relation of the idea of energy with that of some activity or motion.

We have seen that motion, regarded as an objective fact, is quite meaningless. If this is true, what becomes of energy which is supposed to initiate and maintain a movement. In our experience the two ideas are inseparable. Motion can only be understood as a form of energy, and energy as a particular movement or activity. It is common to speak of energy as the cause of motion, and motion as the result of energy. But this is because we first separate energy and inertness, and then produce motion by uniting them. But such separation and consequent union are inconceivable. Energy is not a substance that can remain by itself without doing anything; if it could do so, it will become another inertness; we cannot separate it from the idea of activity. But just for this very reason it is an anomaly; for though activity can only be explained by the idea of energy, it is equally bound up with the idea of inertness; there must be something that is acted upon or moved, something that has no self-motion and can offer resistance. Our problem therefore is *how to conceive together* both energy and inertness in the unity of motion.

It will be instructive in this connection to analyse the generation of a movement.

A thing cannot move itself: the cause of its movement must lie outside it.

We see a thing moving. But can a thing move itself? This is inconceivable; for, according to the law of the persistence of rest, a thing continues to be where it is and as it is, until its equilibrium with other things is destroyed by some outside agency, and when this is done, it at once moves to its new position of rest to establish the lost equilibrium once again. Speaking about this law Lotze says, "In all our actions the representation in our minds of an aim that is not yet realized, of a goal that is yet to be reached, may itself be present and effectual among the conditions of the activities which are set in motion to attain our purpose. But there cannot be an inner state *q* of any thing such as to be for that thing the *condition* of its *being* in another particular state *r*." A thing can, therefore, only be moved from outside. In the words of Lotze, 'even if we admit an abundance of inner life in everything, still we cannot derive the initiation of a movement in space from that life, but only from external determining conditions.' Again he says, "It is, therefore, in fact, this state of inner want of equilibrium which hinders *e* from remaining at rest; only this state cannot have arisen in a way to determine the line of motion, unless *e* is conceived as part of a universe which by the configuration of its other parts at any moment helps to determine that of *e*'s inner being."

Nor can one thing move another.

Our next question is, can one thing move another ? This too is inconceivable. Where we have only things, we cannot find any power of initiation ; for this power implies a capacity of going out and affecting while remaining all the time at rest ; but when one thing is said as moving another, the moving agent itself cannot be conceived excepting as 'being moved'; it only *communicates* an impulse which it itself but passively receives from outside. We can thus go from object to object without sensing power or initiative force anywhere.

No sense of power in outside change : we go from one static thing to another without end.

All *power outside* can be power in no sense. We know the steam engine, but we have no sense of its power. We can conceive steam rushing through, opening the valves, and moving the piston; but if we analyse our knowledge, we shall find that we know the valves, the piston and the steam, perhaps also the different particles of steam occupying different positions in space, all along a line, all equally static; nowhere do we sense the moving power; each particle of matter refers us to its neighbouring particle for its own movement, and so we go all along the line, round circuitous paths, meeting a first impulse nowhere.

Every change, mere change, is devoid of any sense of efficiency; it is mere drifting. We find a raft going along the current or the wind. But is the water or the wind efficient? It cannot be. Each material particle composing them obeys the same law as the raft,—it is equally drifting. The whole universe of matter is subject to this law. Wherever we alight we find that everything is being driven, but there is no driver. From the power-house to the minutest part of the machinery it moves, every particle is being moved, there is no mover.

We are directly conscious of power only in our own activity.

Efficiency cannot be conceived as existing in the world outside us; causation itself is a notion derived from our own conscious activity; and it is the unconscious basis of this experience that makes the very change of nature intelligible to us. But this intelligibility is at the same time an irrefutable proof of the anthropomorphic character of all our readings of nature, in fact of all our meanings. We are directly conscious of power in our own actions, and it is by the projection of this experience into the world outside that we have created the conception of energy, and appear to understand it in its full significance even there.

The distinction of agent and patient.

If now we analyse this experience, we find that a distinction between agent and patient is implied in it. An agent is that which moves without itself moving; as Lotze says, "In animated beings the element which is charged with the unspatial work within does not set itself in motion, but only other elements with which it is in interaction." A patient is that which is moved without moving anything. Ignoring for the present the fallacy of Lotze's postulate of an interaction between the unspatial and the spatial, we can easily understand why the agent itself must remain unmoved. If it itself moves, we shall have to seek the cause of its movement outside it, and this will degrade it to a patient. No element, whether animate or inanimate, can be conceived as moving itself; for all motion is due to a lack of equilibrium, *i. e.* to a cause outside each element as we have already shown. And once we go to outside causes, we lose all sense of efficiency. It is only in our own experience as persisting and unmoving agents that efficiency gets its meaning.

How can movement be produced from two immobilities? Any interaction between the spatial and the unspatial inconceivable.

But if the agent moves nothing, who can say that it is efficient, that it is possessed of power? Herein lies our great dilemma. We recognize efficiency only in motion, and yet we cannot conceive how an immovable reality can produce a movement. *We are always obliged in thought to picture the agent itself as moving before it can move the supposed patient.* But the moment we do this, the agent has ceased to be an agent, and its movement requires an outside accounting. Lotze, like the Sãnkhyãs, has tried to get over the difficulty by a blind leap,—an inexplicable interaction between the spatial and the unspatial. But the moment we try to give any *meaning* to this interaction, the unspatial is degraded to the spatial; we can only conceive interaction between extended surfaces; the unspatial reality can have no point in contact with the spatial, through which it can exert its influence. And once these points are conceded, the whole becomes a mechanism which is driven in each of its parts, but has driving power nowhere. How then are we agents? And what is our sense of efficiency? The analysis of an act of will might throw some light upon the problem.

Analysis of an act of will.

The simplest act is that which is actuated by a simple and almost sudden impulse. Here some action has been done, and an action that was not mechanical and so determined by nature; my inner experience attests to this; I 'own' it in a sense in which no machine owns its actions. It is only figuratively that we say that a machine works the factory, or a gun kills the army; in fact it is man that is the real doer or actor. A machine has no sense of individuality; each part of it is indefinitely divisible, and the whole obeys a law which it can neither change nor modify. Man alone determines his own actions and is a law unto himself; consequently he owns every bit of action that emanates from him. Here then, in human activity, we are within the power-house itself.

No sense of power from perception right up to the completion of the whole set of bodily movements involved in the particular act.

Now the question arises, wherein lies my sense of efficiency? I see the book lying on the table. So far I am not conscious of any power. No doubt according to Bergson, every perception is a nascent action; but if we stop with what he calls 'pure perception', which is impossible in the case of a grown-up man, our action is so far necessarily determined, and we have no consciousness of power. A real human perception is already complex, for our past experience has sought points of association and similarity in it, and got itself embodied to that extent. The normal perception, therefore, is a certain attitude which implies motor adjustment. But even yet we are quite unconscious of any action, and the adjustment is at best blind. The more however we try to put meaning in the book the more is our activity stimulated,—till, suddenly, with a flash of new meaning, the whole set of bodily movements is gone through, the book is lifted, opened at some page, and perhaps kept back again. Now if we analyse this whole process of action, we find that we were, at no point of time, conscious of it. We do not know the exact beginning, the moment when we just raised our arm; nor the power that sustained the activity all along; in short, our mentality was under a sort of intoxication. We shall feel greatly surprised if a physiologist were to lay bare before us the forms of the several internal organs, their complicated connections, and in fact the whole machinery involved in the particular act. Where exactly we set the machinery in motion, how we continued to supply power to it,—we do not know. Our action is as much a surprise to us as it can be to any indifferent spectator. It is only strange that I still claim it as my own.

Was there any such sense when the process was just begun?

We thus find that we have no sense of power so far as we simply look on. Nor have we any such sense when the action is being actually performed. It might, however, be argued that we had this sense when we just began the process. But if we are true to experience, we shall find that we were ignorant of the exact moment when the action began; we saw the rising arm,—we knew not 'where' and 'how' *we* set it in motion; and paradoxical though it may appear, it is not wrong to say that motion somehow caught hold of the limbs rather than *I* initiated it. There is no *continuity* whatsoever between my sense of 'Self-hood' and the so-called 'my action'.

The sense of 'can'.

There is still a possible way out to the opposition. I am not conscious of power when I simply look on; nor when the action is taking place; nor again at the beginning of it. But the period between merely looking on and the actual initiation of the movement, is very significant. Here I do not simply look on, nor do I actually take up the book; but I feel that I 'can' lift it. What is this sense of 'can' if not a sense of power? Let us analyse it. So far as the book is not yet lifted, *the power of doing that* is still dormant. But there is no meaning in a sleeping power. Power can only be understood as power when it effects results; and here results are altogether lacking. It might be said that the actual movement is, in this case, preceded by an imitation movement of the motor apparatus involved, that we nascently go through the whole process before we actually perform it. But even then, this nascent movement can only partake of the nature of the actual movement, and if, as we have seen, the latter surprises us with its actuality, the former can do no less. Both alternatives, therefore, fail to give us any satisfaction. *If the movement has not taken place, efficiency is meaningless; if it has, it surprises us no less when it is nascent than when it is actual.*

The meaning of this 'can' should be sought in our spiritual nature.

Perhaps some might argue that the meaning of this 'can' should not be sought in any movement actual, potential or otherwise, but in our spiritual nature. This is to cut at the very root of the alliance between efficiency and activity, and to open a way to a new realm of reality where the meaning of power gets completely transformed. We leave the region of our mentality where deliberations, resolutions and impulses continue themselves into acts, and sense power in its fullness and sufficiency; we shall now briefly indicate the nature and the meaning of this power.

Can power be limited?

The sense of 'can' points to our spiritual nature, and an immaterial efficiency. But then we are also conscious of our inability to do many things. How is it that my spirit can be dominated by circumstance, and be forced sometimes to assert that it 'cannot' do this or that? Is it limited in power? But that which is limited must necessarily be formal; it can be power in no sense. A *limited power* is a contradiction in terms; it can at best be a definite quantum, which is our way of describing in abstract intellectual phraseology a phenomenon which we do not understand. Can power be a quantum, and creativeness a prescribed 'so much'? We must be able to hold it together, and limit it by outside conditions, before we can designate or describe it. An immaterial reality cannot be amenable to such handling.

The evidence of our consciousness points to the unlimitedness of our nature.

The evidence of our own consciousness is still more conclusive on this point. Is our sense of 'cannot' a sense of a 'quantitative inability'? If it were, we shall not even be able to make the negative assertion that we cannot do this or that; for, an object of limited capacity is only given to work within its limitations; it cannot shake these off, take its stand on a higher and neutral platform, and view its limitations complacently from outside. And yet this is what a negative judgment implies. The moment we are conscious of an inability or a limitation, we have proved that we are greater than that inability and that limitation,—we are truly unlimited and absolute; there is nothing to prescribe our nature or our power; for, every such prescription is *known* by us,—it is outside us.

What we understand by an instrument and its limitations.

But then, if such is our nature, how can we account for our shortcomings which are equally evident and beyond question within each individual consciousness? Surely, it is no *explanation* to say that the Spirit is by nature unlimited, and that the limitations only belong to the instrument through which it is working. For, we would not feel the limitations as our own, if they did not form a part of our nature, but belonged to an outside agency. The objection is legitimate, but it is based upon a false conception of the instrument. We always, in ordinary life, make a distinction between the worker and his tool. We conceive them both as things, and then picture the one as overlying and restricting the other. All our ideas of limitation are derived from this duality and the consequent conflict; we say the worker is limited by the tool, and the efficiency of the tool by the skill of the worker; we cannot get beyond this image, however hard we may try to conceive limitation in any other way. And yet this image is grossly false when applied to the assertion,—I cannot do this or that. The Self is not one thing and its instrument another, and we to allocate the responsibility of limitation between them. *Limitation ceases to have any meaning among things.* Though commonly we speak of a thing as limited, the assertion passes off as a truism, because we are not at the time interested in pointing out that *a thing or a limitation can only exist as such in view of something that is unlimited, the seer.* If things could limit the latter, the latter will itself become a thing, with the result that limitation will cease to have any meaning, and the very things with which we started will disappear. Limitation and so thing-hood imply the unlimited.

Example from vision.

The Self and its instrument are not two things. If they were, the very consciousness of limitation which we presume we have, will become impossible. We say the vision of the subject is limited by the eye. But we cannot separate the eye from the subject. The eye which we know and which we see reflected in the mirror is not the eye which gives form to things. That eye is a material thing like the flower, the stone, and other things which, it is presumed, it sees. It is a piece of matter like any other piece,—how can it see them? But the eye which gives form to things, cannot be separated from the Self; it is not one thing, and the Self another thing limited by it.

Are we not moving within hopeless inconsistencies?

It might be said here that we are moving within hopeless inconsistencies. We say that the Self and its instrument are not two things, for then the consciousness of limitation, which implies the unlimited, will become impossible. We also say that the instrument cannot be separated from the Self, and that they are in fact one and the same reality. *Where is then any room for the admitted consciousness of limitation?* The Self is unlimited; an instrument cannot exist apart from It, a thing cannot affect or limit It. The moment we suppose such an instrument or such a thing, the Self itself becomes a thing, and limitation becomes meaningless. What have we gained by all this roundabout reasoning?

The unlimited is the only meaning, and the only truth.

Indeed, taken abstractly, we have proved nothing. But the truths of philosophy are always a personal matter; **they must be *seen* and cannot be** *held to view.* And those who look with this discriminating eye will find that the meaning of limitation can only be found in the Unlimited, and that limitation as such is a meaningless deceit of thought. A limitation is a limitation, and an instrument an instrument, *only as* they are asserted by the Self. They are not facts standing by themselves, as the tools and other materials of a worker are conceived to be. Their very form of existence is dependent upon the Self,—which is the truth, the only reality. A limitation cannot exist apart, a separate thing; *nor in That which gives it all its meaning, and in the very moment of its assertion goes beyond it,—proves its own unlimitedness.* Where is limitation then? Nowhere, excepting in our shortsightedness, in our belief that it is there—always haunting us! Those who see the infinitude of their Self,—they see nothing beside It, they see no limitation anywhere.[†]

[†] I am quite conscious of the inadequacy of the treatment here. Many questions will be proposed and doubts raised. But we cannot enter into them here, for this will carry us to a much wider field. The truths of Advaitism are closely interlocked, and I can only hope to meet the legitimate objections on this point in a future work. Here I must only point out that the unlimited should not be taken as a correlative of the limited after the manner of Sri Aurobindo Ghose. Correlation exists for the intellect only and between limited conceptions. The unlimited is rather the truth of every correlation, its dissolution.

We thus find that our actions give us a sense of efficiency at no point; and that the true meaning of energy lies in a complete realization of our spiritual nature. But then it ceases to have the form of 'can' or 'cannot' which are relative to the supposed instrument of the Self, or better still, which are mere creations of our ignorance or refusal to analyse their meaning. When, however, we have undertaken this analysis, and are led to our spiritual nature, we find that that very moment 'efficiency' has lost all meaning commonly connoted by it. Where the power has no limit and the nature has no other, all ideas of exertion, creation, strain and energy are equally meaningless. We create a deficiency before efficiency can have its form. But when we plunge into the Infinite Fullness, into All-Power, where is room for demolition and creation, destruction and construction? There is neither mover nor movement, no creator no creation, no doer no action.

The true sense of Power.

We wanted to explain efficiency; we have ended by showing it as meaningless in the ordinary sense of the term. That sense appears significant, because we are strangers to our own experience, and do not examine all our ideas with the search-light of higher reason. The result is that our knowledge is mostly made up

Conclusion.

of ill-understood conceptions and words; and it is not strange that we are surprised at the truth and novelty of their meaning, when we rise to a true sense of reality. Is it not a paradox, for example, that we should know power in its limitations only, as 'so much power', and not in its exuberance and fullness? As a matter of fact we best realize the meaning of efficiency, when we are not conscious of any deficiency, movement or creation; for these prescribe our power, reduce it to a quantum, and show forth efficiency as non-efficient. Real Power is unconscious, because it is self-conscious. How can it continue itself in this movement or in that, when it is the soul of all movement,—its true meaning and only truth? Those who have risen to that meaning see the activities of the whole universe as tunes of the rhythm of their Self, and yet *that rhythm is a rhythm because in its meaning it is free from all tunes*, it is the realization of That besides which nothing is and nothing can be.

FINISH.

By the same Author,

THE PROBLEM OF NOTHING,

PUBLISHED BY THE

INDIAN INSTITUTE OF PHILOSOPHY,

AMALNER.

PRICE Re. 1.

Some Opinions.

DEAR SIR,

Please accept my thanks for the deeply suggestive pamphlet of yours on the Problem of Nothing. Not being a student of philosophy myself, I cannot judge your book from a technical point of view, and all that I can say is that it has given to my lay mind food for thought for which I am grateful to you. I believe that the contribution to the idea of the Self which your book makes is original and therefore valuable.

Yours Sincerely

(Sd.) Rabindranath Tagore.

"Mr. G. R. Malkani's little monograph on *The Problem of Nothing* (Amalner: Indian Institute of Philosophy, 1918) deserves to be known in England on account of the light it throws upon Indian modes of thought. The writer criticises Bergson's treatment of the idea of "Nothing," and argues that Bergson must either admit the reality of the matter or else admit that the *élan vital* has nothing to endure against, nothing to press against, nothing wherein to create, so that, in that case, the idea of "nothing" cannot be said to be a pseudo-idea. As against Bergson, he urges that "reality as meaning" is a higher conception than "reality as creative," because the latter must be limited, and will, therefore, always have a "not" attaching to it, while the former as a whole can have no "not" attaching to it."—

The Hibbert journal.

Dear Mr. Malkani,

Many thanks for the copy of your book 'The Problem of Nothing', which you have so kindly sent me. So far as I am aware, this is the first piece of evidence that the Institute of Philosophy at Amalner, has given to the public, of its work in the field of Research. You have tackled one of the most interesting problems of metaphysics, which owes its modern importance and prominence chiefly to Bergson. To the student of Hindoo philosophy the subject is as old as the hills. But this is the first attempt made at a co-ordination of some of the eastern and the western thoughts bearing on the subject. You have displayed considerable ability in showing how advaitism not only agrees with the views of one of the well-known modern philosophers of the west but also "goes beyond", and you are right when you hold that the problem of "Nothing" is only the problem of "Reality" viewed from another standpoint. You base your arguments upon the central Vedantic doctrine, the one distinguishing feature of Vedanta, *viz.* the metaphysic of the Three States, to which Europe is yet a perfect stranger. You have, therefore, rendered no small service by drawing attention to it. But it must be pointed out that your approach to the subject is not likely to carry conviction readily to western minds or to such eastern minds as have been trained on western lines. If you had pointed out the logical basis and the metaphysical value of this Vedantic doctrine before applying it to this particular problem, you would have succeeded much better. Your reflections on "Zero" though thoughtful and original, suffer by being presented in what will certainly be taken to be a dogmatic form.

On the whole, you yourself and the Institute, deserve warm congratulations in that this is a highly praiseworthy attempt, at bringing to the notice of the general public not only one of the distinguishing features of Vedanta as expounded by Shankara, but also some of its bearings on problems dealt with in European philosophy.

I am,
Yours Sincerely,
(Sd.) V. Subrahmanya Iyer.

NOTHING:—Most of our readers would be of the opinion that there was little or nothing to be said about nothing. That is the common-sense view. But there is an uncommon-sense view, the possession of sages and uncommon people and of them who write books, that there is quite a lot to be said on the subject. For example, Mr. Belloc has written a whole book of essays about nothing. We are once again reminded of this fact by the receipt of a brochure from the Indian Institute of Philosophy at Amalner. The title of the brochure is "The Problem of Nothing," the author, Mr. G. R. Malkani, and the contents an essay of some 14,000 words on the philosophical content of nothing or non-being and a comparison of the treatment of non-being in Bergson and in Advaitism. The object to serve which the Indian Institute of Philosophy was founded was to "encourage a comparative study of Eastern and Western philosophies and set forth the results of such research in an intelligible form for the benefit of all those thoughtful people who are interested in the highest problems of life." If the present volume is typical of the publications which the Institute is issuing, we are bound to say that the aim which the Institute sets itself is likely to be fulfilled; for the author of the essay on Nothing presents his thesis very readably and in the clearest possible manner. We emphasise the readability of the book chiefly because the value of philosophical literature is apt to be underestimated. The complaint is often made that there are too many facts and too little thought about modern education, and that what is chiefly required by all mature pupils at schools and students at universities is a thorough grounding in metaphysics so that accurate and profound thought may be more commonly met with than at present. If the publications of the Indian Institute of Philosophy do anything to help on the achievement of this aim, it will have performed a considerable public service"—

Times of India.